Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York.

All communications should be addressed to the New York Office, 30 Church Street

Subscriptions including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions $8.00.

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, $1.00; foreign countries, $2.00. Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 86 June 29, 1929 No. 26

In this Issue

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

Railway Age

Vol. 86, No. 26 June 29, 1929

Table of Contents Appears on Page 5 of Advertising Section

Valuation and Recapture

THE principal question directly involved in the O'Fallon case was as to the way in which the valuation of a railroad should be made for the purpose of determining how much of its earnings could be recaptured by the government under section 15-A of the Transportation Act. There was also indirectly involved the question of the way in which a valuation should be made as a basis for the regulation of rates; and the probable effect of the decision of the Supreme Court on rate making has been generally regarded as of so much more importance than its probable effect on the recapture of earnings that the latter effect has received comparatively little discussion.

The views of many persons are expressed by Linton W. Stubbs in a letter which we publish elsewhere in this issue of the *Railway Age*. "The main benefit that will accrue to the roads," says Mr. Stubbs, "will be to some of the prosperous ones, in that the recapture clause of the Transportation act will be practically annulled." As most of our readers know, the recapture provisions are to the effect that when any railway in any year earns over 6 per cent upon its valuation, one-half of the amount earned in excess of 6 per cent must be paid over to the government.

Will Recapture Be Prevented?

Why do Mr. Stubbs and many other persons believe that the Supreme court's decision will practically annul the recapture provisions? Section 15-A directs the Interstate Commerce Commission to determine what will be a fair return for each group of railways to earn upon their aggregate valuation, and to so adjust rates as to enable them, under honest, efficient and economical management, to earn this return. The Supreme court, in its O'Fallon decision, has passed upon the way the valuation of each railroad should be made to the extent of holdings that present day costs must be considered. This does not affect the requirements of the Transportation act as to the way in which the commission shall use valuation as a basis for the regulation of rates. The commission has held that 5¾ per cent would be a fair average return for each group of railways. It is extremely doubtful if it could legally hold that a lower return would be reasonable, because the Supreme court, we believe, never has held that any return less than this would be fair. But if the railways of any group earn in any year an average of 5¾ per cent on their aggregate valuation, it is almost certain that some of them will earn over 6 per cent, and will, therefore, have earnings subject to recapture.

The conclusion that the O'Fallon decision will nullify the recapture provisions must be premised upon the expectation that the final valuation will be so big that the railways never will earn an average of 5¾ per cent on it, either because the Interstate Commerce Commission will prevent rates from being made high enough or because the railways will voluntarily refrain from making them high enough. In that event, the nullification will not be confined to the recapture provisions. It will include also the rate-making provisions of section 15-A, for the reason why the more prosperous roads will not have to pay anything under the recapture provisions of section 15-A will be that the rate-making provisions of the same section are not being carried out.

The La Follette valuation law was passed in 1913. The Transportation Act, including the rate-making and recapture provisions of section 15-A, was not passed until seven years later. By the terms of section 15-A, however, both rate-making and recapture are based upon valuation. The railways in some important rate cases before the commission have asked it to use the investment in their properties shown by their books as a basis for the regulation of rates; but they never have in any important case joined in asking it to use any higher basis than this. Past developments indicate that most of the railways would not be much dissatisfied with rates that would yield each large group of railways an average of 5¾ per cent annually upon its aggregate property investment, provided no such large deductions for depreciation were made as was contemplated in the commission's method of valuation. To state the matter concretely, the Class I roads (exclusive of switching and terminal companies) had a property investment in 1927, (including materials and supplies and cash) of more than $24,800,000,000. To have got an average return of 5¾ per cent on this, they would have had to have earned a net operating income of almost $1,430,000,000. They actually earned only $1,068,000,000, which was equivalent to 5¾ per cent on only about $18,600,000,000. These figures indicate both why they were dissatisfied with the return actually earned, and why they probably would be satisfied with 5¾ per cent as an annual average on their property investment.

Effect of Recapture on Valuation

The questions presented by rate-making and recapture are widely different. The former concern the roads as a whole or by groups. The latter concern individual roads. Therefore, while a railway with an earning capacity greater than the average of its group might be satisfied with its share of earnings that would yield the roads of its entire group 5¾ per cent on

their aggregate property investment, it very likely would not be satisfied, in view of the O'Fallon decision, to have a valuation equivalent to its property investment used as a basis for the recapture of earnings from it. It might have a property investment so low in proportion to its reproduction cost or earning capacity that it would go the limit of litigation in trying to get the highest possible valuation in order to reduce as much as possible the amount of its earnings that could lawfully be recaptured. The larger the valuation of each individual road is made, of course, the larger will be the aggregate valuation established as a basis for the regulation of the rates of the group of roads to which it belongs.

It is very doubtful whether, from the standpoint of either the railways or the public, it is desirable that there should be such almost interminable litigation over valuation as the recapture provisions may tend to cause. As this paper has intimated before, we believe serious consideration should be given to the question of whether it might not be possible, through conferences between members of the Interstate Commerce Commission and representatives of the railways and the shipping and traveling public, to arrive at some compromise basis for the regulation of rates which would be higher than a valuation made according to the method formerly favored by the Interstate Commerce Commission would be, but lower than one made principally in accordance with present day costs would be. It was found possible for the government and the railways to settle without litigation the large amounts payable to the railways as the result of our experiment with government operation. Would it not be possible to settle the basis of rate regulation in some such way? The recapture provisions may be the most serious obstacle to such settlement. If so, the *Railway Age* would favor their repeal, although this paper advocated and always has defended them.

Laws Should Not be Nullified

The Supreme court has told the Interstate Commerce Commission how not to make a valuation. It has not told it how to make one. The commission's method must be discarded. Weight must be given to cost of reproduction—but nobody knows how much weight. Weight must be given to other factors, such, for example, as earning capacity—but nobody knows how much weight. How long will it take to settle these and other questions as they affect each railway? Because of differences of opinion between the officers of different railways, and between them and members of the Interstate Commerce Commission, a large part of the effort and money devoted to the work of valuation during the last 16 years has been wasted. If a valuation of all the railroads is not desirable, and is actually impracticable, then the whole scheme should be abandoned, in order to stop the waste of effort and money. If a valuation of all the railroads is desirable for the regulation of rates, then it is undesirable to go on squabbling interminably over the way in which it should be made. There is precious little difference between a scheme that is wholly impracticable and one the consummation of which promises to be deferred for several generations.

The provisions of the Act to Regulate Commerce regarding valuation, rate-making and recapture of earnings should be nullified. If they are practical and can be made beneficial they should be carried out. If not, they should be repealed. When laws for the regulation of business are not carried out in accordance with their plain language and purpose, regulation either ceases to be effective or becomes a purely arbitrary exercise of power by administrative bodies.

Centralized Control Foreseen in 1842

THAT a single-track line is less expensive and cheaper to operate than a double-track line was readily apparent even in the early days of the railroad. The practical problem then, even as now, on many single-track lines was to avoid collisions and get the trains over the line without incurring serious delays. The telegraph was first used for the transmission of a train order on the Erie in 1851. However, prior to that time electric instruments were used for the direction of train movements on the railroads in England. In 1842, Sir William F. Cooke, connected with the Great Western and Blackwell railways in England, in his book, "The Telegraphic Railways or The Single Way," advocated the use of single-track as being more economical than double-track. He explained that the construction of a second track, mainly to guard against the danger of head-on collisions, is not economical, and that single track equipped for controlling and directing train movements is entirely safe and more economical.

Our present-day systems for the operation of trains by signal indication with central control are a complete realization of the idea advanced by Cooke in 1842, plus the use of modern signaling appliances in which the track circuit plays a leading part, making it possible to operate a single-track line with maximum safety, economy and efficiency.

Relief Train Operation

THE operation of relief trains is not receiving the attention it deserves on some railways, and trainmasters, superintendents and even general superintendents should not overlook relief trains in the press of other matters which may seem of greater moment. The make-up of relief trains is the first item deserving of attention. Too often such trains may be seen with the derrick car in the center or near the rear end of the train, where, in case of a break in the air line, or a derailment, it would inflict heavy damage on the other equipment and injuries to the occupants. Because of its weight, the derrick car should always be at the head end of the train. As a further precaution, no members of the crew, with the exception of the derrick engineer, should be permitted to ride on the derrick car. Their place is inside the cars provided for them, until the scene of the accident is reached.

Once in action, the relief foreman should be permitted to give all orders relating to the clearing up of the wreck. Any supervisory officers present should transmit their orders through him. Usually, the orders are transmitted to the crew by a signal man. It is important that all concerned should have a thorough understanding of the signals, and supervisory officers should see to it that this is the case. Fortunately, the relief outfit is being called upon less frequently as operating methods improve and safety increases, but, when it is needed, the need is great, and operating officers should know that its performance will be efficient.

The "Blue Comet" a Success

THE Central of New Jersey, which inaugurated its "Blue Comet" trains between New York and Atlantic City five months ago, has added two schedules to this service—one on Friday afternoon southbound, and the other northbound on Sunday afternoon. The equipment and service of the Blue Comet trains were described in the *Railway Age* issue of March 2, 1929, page 529.

The Blue Comet is not one train, but two in each direction daily. All passengers are, at the price of straight railroad fare, provided with reserved seats in coaches equipped with bucket type seats and, in addition, they are given the privilege of observation car and lounge facilities and porter service. The cars and locomotives are specially decorated—outside colors being blue and cream—and other conveniences not ordinarily provided passengers without additional charge are offered. From the outset the train has been a success, attracting new business, particularly persons who without such inducement to travel by rail would have made the trip in private automobiles. The service has drawn wide interest, not only on the part of the public, but on the part of employees as well. This latter fact is amply demonstrated by the 99.81 per cent on-time performance attained since the trains were inaugurated—a record which could have been achieved only by the hearty cooperation of the entire railroad organization. Not only has the railroad put additional schedules into service, but it has had to acquire additional cars and locomotives of Blue Comet specifications to handle the increased business.

In these days of uncertainty in passenger business, experimentation is essential. As with all experiments, some such efforts will be decidedly successful, others will be moderately so, while still others will meet with failure. The Blue Comet idea has won its place in the first-mentioned category—success.

Favorable Railway Results

THE first half of 1929, which will end tomorrow (June 30), has been the most prosperous first half of any year that the railways of the United States have had since 1916. Complete statistics of revenues and expenses for only the first four months of the year are now available; but car-loadings in May and June were so large as to indicate that the net operating income earned in those months was relatively as large as in the preceding months of the year. The return earned by the Class I roads in the first four months of the year on property investment was at the annual rate of 5.54 per cent, as compared with 4.89 in 1923; 4.45 in 1924; 4.41 in 1925; 4.76 in 1926; 4.63 in 1927, and 4.32 in 1928.

The year 1926 was the most prosperous entire year that the railways have had since the war. There is a marked difference between the relative prosperity enjoyed by the various groups of roads in that year and thus far in 1929. The three large groups earned at the following annual rates in the first four months of 1926 and 1929. Eastern, 1926, 5.61; 1929, 6.18; southern, 1926, 5.71; 1929, 4.34; western, 1926, 3.53; 1929, 5.28. The southern roads benefited for a few years by the Florida boom and other favorable conditions, and have suffered ever since 1926 from a reversal of those conditions. The most remarkable improvement shown is in the earnings of the western roads. Whether, in view of the changes that are occurring in the condition of agriculture, this will continue is uncertain.

The average freight revenue per ton mile being received by the railways is lower than it was in 1926, and the average wage being paid by them is higher. Their passenger business is smaller. Why, then, have they been more prosperous than even in 1926? First, their freight business has increased, and they are receiving more compensation for carrying the mails, in consequence of which, in spite of a decline in passenger traffic, their total earnings in the first four months of the year were $23,000,000 greater than in the first four months of 1926. Second, their operating expenses showed a reduction of $48,000,000, of which approximately $23,000,000 was due to a reduction in the total amount of wages paid, and the rest to savings of other kinds. The number of employees was approximately 116,000 less than in the corresponding part of 1926. The increase in taxes was $10,000,000; but this was so much more than offset by the increase in earnings and reduction of operating expenses that the net operating income earned increased $54,000,000.

The statistics of the western roads are highly significant as an indication of changes that have occurred in their territory during the last three years. The increase in their freight earnings in the first four months of the year, as compared with the corresponding part of 1926, was almost equal to the total increase in freight earnings that occurred in the country, and, in spite of a loss of passenger business, they showed an increase in total earnings of $45,000,000, which was almost twice as great as the increase in total earnings of the Class I roads as a whole. The explanation is that the eastern lines had only a small increase in total earnings, and the southern roads had a decline. The western roads had an increase in operating expenses, and also, of course, in taxes, but these increases were small compared with their increase in total earnings, and their net operating income was $27,000,000 more than in the first half of 1926.

When the situation as a whole is surveyed it becomes evident that the railways are prospering more than in 1926 mainly because of increases in their economy of operation. While in the first four months of this year their total earnings were $23,000,000 more than in 1926, their taxes were $10,000,000 more. The substantial increase in their net operating income was therefore, principally due to the reduction of $48,000,000 in their operating expenses. As already pointed out, about one-half of this reduction in expenses was due to a reduction in the number of employees. This process of reducing the number of employees has been going on steadily ever since 1923. The average number of employees in 1928 was the smallest since 1922, and there has been no increase thus far this year, in spite of the large increase in traffic. Unemployment due to improvements in plants and methods has become known as "technological unemployment". It is a result of industrial progress, but is unfortunate for the men thrown out of work unless they promptly find employment in other industries.

With the best first half of any year since 1916 behind them, the railways have before them the prospect of a continuance of unusually satisfactory earnings during the second half of the year. Just what changes may occur that will affect the volume of freight business cannot, of course, be foreseen. Some authorities are beginning to predict a moderate recession in business, but if one is coming it is not likely to come soon enough to prevent the year's railway financial results from being the best since before the war.

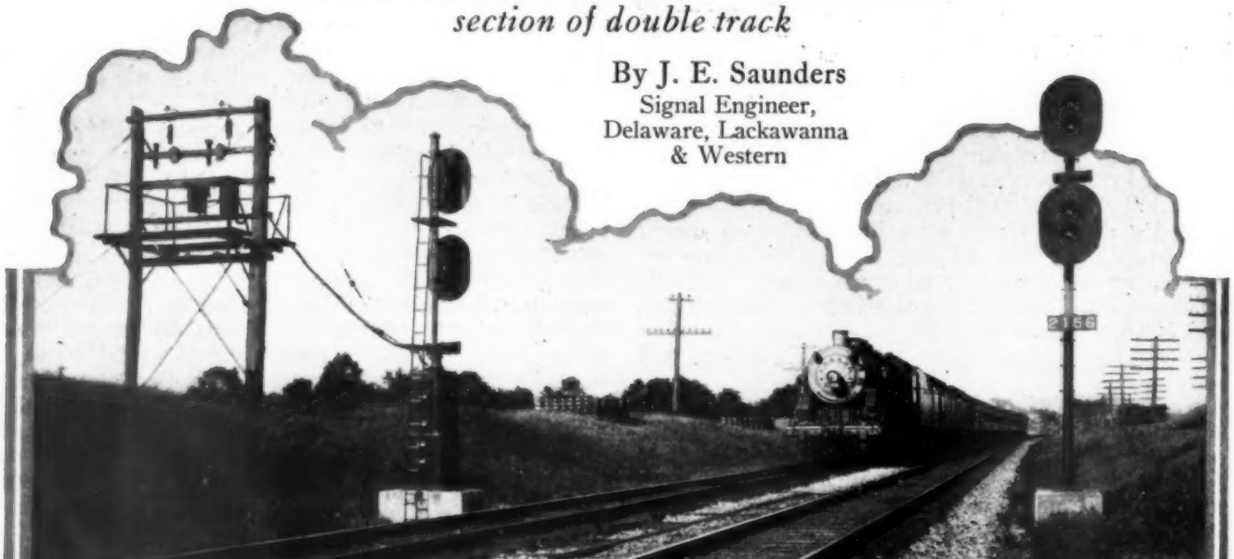
Lackawanna

Modernizes Signal System

for Automatic Train Control

Change from semaphore to color-light signals shows a net annual saving of over $2,000 for a 57-mile section of double track

By J. E. Saunders
Signal Engineer,
Delaware, Lackawanna
& Western



"Lackawanna Limited" Near Owego, N. Y.

THE introduction of automatic train control on many railroads has resulted in a careful consideration of its effect on track capacity, as well as the increase in safety of operation. Naturally, existing signal facilities were checked up in order that they might be made to conform to the braking distances required for automatic, rather than manual, control of the air brakes. In many cases this necessitated a reduction in the number of signals used and in the replacement or elimination of wornout roadside signal appliances. It has meant the substitution of central-station energy for batteries where the train control required alternating current. All these changes have added to the cost of train control, but it is interesting to note that there is some economic justification for the money thus spent. The first part of the main line of the Delaware, Lackawanna & Western from Buffalo to New York passes through rolling country with only a few grades over 0.5 per cent, but after leaving Binghamton, N. Y., two ranges of mountains are crossed before entering New Jersey. Because of heavy grades in portions of this territory, a number of changes were made in the existing signals when train control was introduced.

In compliance with the first order of the Interstate Commerce Commission, No. 13413, the Lackawanna installed automatic train control on the main line between East Buffalo, N. Y., and Elmira, which was placed in service on July 1, 1925. To meet the second order, a second installation, extending eastward from Elmira to Easton, Pa., was made, which was completed on July 1, 1928.

Extent	Miles of Line — Two Track	Three Track	Four Track	Locomotives
East Buffalo to Elmira	141.0			69
Elmira to Scranton	91.44	14.84	9.27	128
Total	232.44	14.84	9.27	197

This territory included 256.5 miles of road and 564.5 miles of main track. It comprises one-third of the total passenger track-miles operated and two-thirds of the main line from Buffalo to Hoboken. Forty-two per cent of all the company's road engines are equipped.

Program to Promote Safety

The Lackawanna has been particularly active in its endeavor to prevent accidents. Since 1910, about 248 grade crossings have been eliminated at a cost of approximately $19,000,000. By January 1, 1928, 36 per cent of all public highway grade crossings on the entire line had been eliminated at a cost of approximately $25,750,000. Of those remaining at grade, 25 per cent

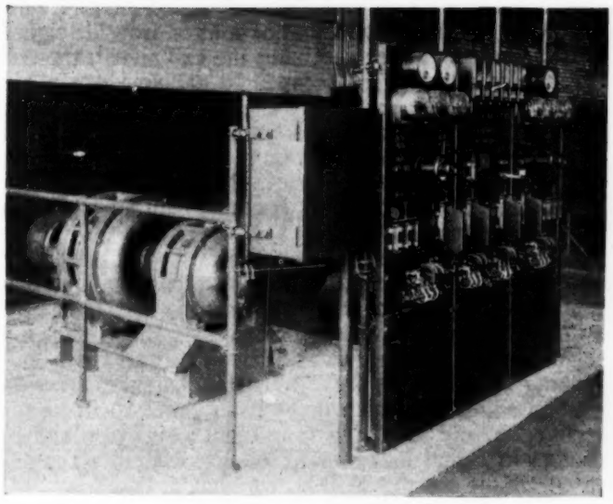
have automatic and 24 per cent have manual protection. At the present time the elimination of 50 more crossings is under way or authorized at a cost of $3,000,000. This indicates clearly the policy of the road to invest in accident protective measure where the greater number of accidents occur; where more lives can be saved and personal injuries avoided. As a result, the Lackawanna has been able to minimize or actually reduce the number of fatalities at grade crossings throughout the years that highway traffic has so greatly increased, and this in the face of a steady increase in fatalities at grade crossings for the country as a whole.

The Lackawanna conducted experiments with train stop systems on its lines as far back as 1913. However, it was found that these early systems did not fulfill adequately the requirements of the heavy traffic which is characteristic of this railroad, or else possessed inherent weaknesses that prevented their adoption. It was not until 1923 that a system was presented that could be accepted as providing adequate protection without too much complication and restriction of track capacity. It is true that train control devices had not even then been fully developed, and a number of changes in detail parts were made after the original installation from East Buffalo to Elmira, but no change has been made or is contemplated in the basic principle involved. Trains are receiving some degree of protection beyond that previously provided by a complete system of automatic block signals. However, there is no record of an accident having been avoided that the automatic signals would not have prevented without train control.

Two-Speed Continuous Train Control

The system adopted as best meeting the Lackawanna's operating conditions is the two-speed, continuous inductive train control of the Union Switch & Signal Company. The locomotives are equipped with both visual and audible cab signals. The visual signal provides a green light when the speed of the train is not automatically restricted and a yellow light to indicate that a speed of 20 m. p. h. must not be exceeded. A change from unrestricted (green) to restricted (yellow) is audibly indicated by means of a whistle in the cab. Both the engineman and fireman are thus given advance warning when entering a danger zone. This indication is given a sufficient distance from the obstruction to provide a six-second delay period to allow the engineman, if alert, to acknowledge it by moving a lever, and to initiate a service application of the air brakes.

Lackawanna Main Line Showing Extent of Train Control Territory



Frequency-Changer Sets and Switchboard at Elmira Power House

Unless either he or the firemen does act, a full service brake application (split reduction) will be made at the end of the six-second interval, and the train will be brought to a stop, the same as when the engineman applies brakes. The only difference is that if the engineman is alert, and does not acknowledge receipt of the restrictive light and whistle indications, and does initiate a brake application, he may, if track conditions permit, release the brakes after the train speed has been reduced to less than 20 m. p. h. As long as the slow-speed (yellow) cab signal indication persists, any increase in speed above 20 m. p. h. will cause an immediate service application of brakes to be made automatically, and the train brought to a stop.

While the cab signals repeat the restrictive indications of wayside signals they do more, for any change in conditions ahead is immediately reflected in the engine cab. Thus a switch thrown after a wayside signal has been passed, or a train backing into the block ahead, will cause a restrictive cab signal indication to be given, with coincident enforcement of speed limitation. Conversely, a train running at less than 20 m. p. h. under restrictive cab signal indication, can resume speed at once when conditions ahead improve; for instance, when the train ahead increases speed or pulls into a siding.

The cab signal is the only feature of the train control system which is of any help in getting trains over the road. It also increases safety, because it informs the fireman as well as the engineman of danger ahead; it also provides a means for taking immediate advantage of improved conditions and allows a train to proceed safely, independent of weather or other conditions that obscure the engineman's vision of fixed wayside signals. Experience has proved the value of this during storms.

The 6,600-volt generating, transforming and transmitting layout has sufficient capacity to supply an ultimate four-indication coder system of train control, a-c. track circuits, and switch and station lighting.

Automatic Signals

Originally, automatic signals on the double-track lines were spaced the practical length of a polarized track circuit, thus avoiding the use of line wires. This meant blocks ranging from 4,500 to 5,500 ft. in length, irrespective of grades. Train control and cab signals

introduced a new problem. The cab signal must give an indication consistent with that of a fixed wayside signal as it is passed. After receiving the cab signal, the engineman is allowed six seconds to acknowledge a restrictive indication and apply the brakes. At 70 m. p. h. for passenger trains this six-second delay means 616 ft., after which a split reduction must be made. Taking all delay factors into account, this meant a decided lengthening of the distance between caution and stop signal locations.

This condition was met on the Buffalo division by overlapping the caution signal controls, providing two caution signals approaching each stop signal, either interlocking or automatic. On steep ascending grades the regular signal spacing was sufficient. In all cases, full braking distance is provided after passing the first caution signal, at which point train control will be effective. While such an arrangement meant a minimum change in signal locations, it required a more complicated circuit scheme with extra signals, line wires, relays, etc. On the Scranton division between Binghamton and Scranton most of the semaphore signals were installed in 1915, and thus have about 15 years of service life left. Instead of overlapping the control of these, alternate signals were removed on down grades and level track, a few signals were moved, and most of them now provide a single caution indication approaching a stop indication.

Between Elmira and Binghamton the situation was different. These signals were installed in 1905, and were badly in need of replacement. After consideration of comparative maintenance and operating expense, it was decided to install color-light signals, and to erect a separate signal department pole line with power transmission at a sufficient voltage to take care of both the signals and the train control.

85 Daily Trains Over Division

Approximately 28 passenger and 57 freight trains are operated over this division each day. Most of these are high-speed trains, and to avoid train delays in the event of power interruption, storage batteries were installed, to provide current for the line relays and to serve as an emergency supply for the signal lamps. Neutral d-c. relays receiving energy from caustic soda batteries are used on track circuits. The train control track transformer secondary winding is connected in series with the track battery, so that the track circuit for signal control is also independent of the power supplied over the transmission line.

It was necessary to carry train control circuits through 19 interlocking plants, all but 5 of them being on the second division. Between Elmira and Scranton most of the top arms of interlocking home signals were changed from two-position lower-quadrant to three-position upper-quadrant in order to provide for equal spacing of trains. At these interlockings, complete approach, route and section locking are provided. All but four of the towers are of concrete.

Construction Details and Costs

Before starting work on the plans, a trip over the road with the superintendent and trainmaster afforded ample opportunity to discuss the respacing of signals. A number were eliminated, and the new color-light signals were spaced in accordance with braking-distance tables and graphs, taking into consideration the effect of grades and curves. Cab signals make the view approaching a roadside signal of less consequence and, therefore, permit of a more nearly ideal train spacing. In all, 128 semaphore signals were replaced by 93 color-light signals. The semaphores were two-arm, two-position, lower-quadrant, providing three indications, whereas the color-light signals provide up to six indications.

The cost comparison is based on replacement costs at current prices, as the old semaphore signals, line wires, insulated wire and cable, etc., were worn out and would have had to be replaced in any case. Relays and all track circuit materials were salvaged by being moved to new locations. While a smaller number of color-light signals displaced semaphore signals, the track capacity was actually increased. A closer spacing with three-block signal indications is provided adjoining terminals, and elsewhere signals are spaced according to the actual running time of trains, taking into account grades and curves.

The replacement cost for semaphore signals in 1928 was determined by using factors developed by the Signal Valuation Committee of the "Eastern Presidents' Conference Group." The cost of the high-voltage transmission line is not included as it would have been required for train control alone and would have been utilized for supplying energy to semaphore signals if these had been retained.

Cost of Automatic Train Control with Changes and Additions to Automatic Signaling and Interlocking*

1. Cost of roadway equipment—train control parts only	$80,693.27
2. (a) Cost of power lines chargeable to train control	157,006.05
(b) Cost of power lines chargeable to signal system	42,792.01
3. Cost of new color-light signal system	150,414.29
4. Cost of changes in existing signaling	219,871.84
5. Miscellaneous changes in tracks, crossing protection, etc.	13,475.64
6. Total cost of roadway installation	$664,253.10
7. Total cost of locomotive equipment	306,083.75
Grand total	$970,336.85

* Figures are subject to slight adjustments resulting from agreements, not yet completed, covering line encroachments.

Cost Comparison of Color-Light and Semaphore Signals—Elmira to Binghamton

	Color-Light	Semaphore
1. First cost	$150,414	$71,334
2. Year installed	1928	1905
3. First cost brought up to 1928 by applying valuation factors	$150,414	$123,943
4. Increase in first cost	26,471	
5. Annual charge for interest (5 per cent) and depreciation (5 per cent)	2,647	
6. Cost of maintenance and operation per year	13,816	18,486
7. Increase in maintenance and operation for semaphore signals compared with color-light		4,670
8. Net saving in annual charges (7 minus 5)	2,028	

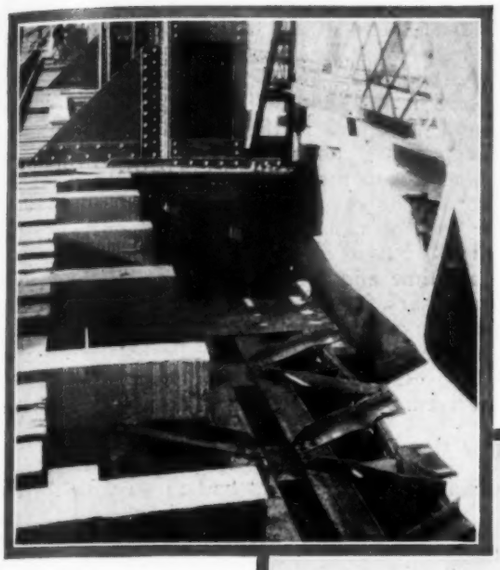
The plans and specifications were prepared in the signal engineer's office. W. A. Comstock, supervisor of construction, had charge of operations in the field, having at times as many as 100 men at work. The signal and train control materials were supplied by the Union Switch & Signal Company; the frequency changers, switch boards, line transformers, protective and switching devices by the General Electric Company, and the insulated wire and cable by Kerite.

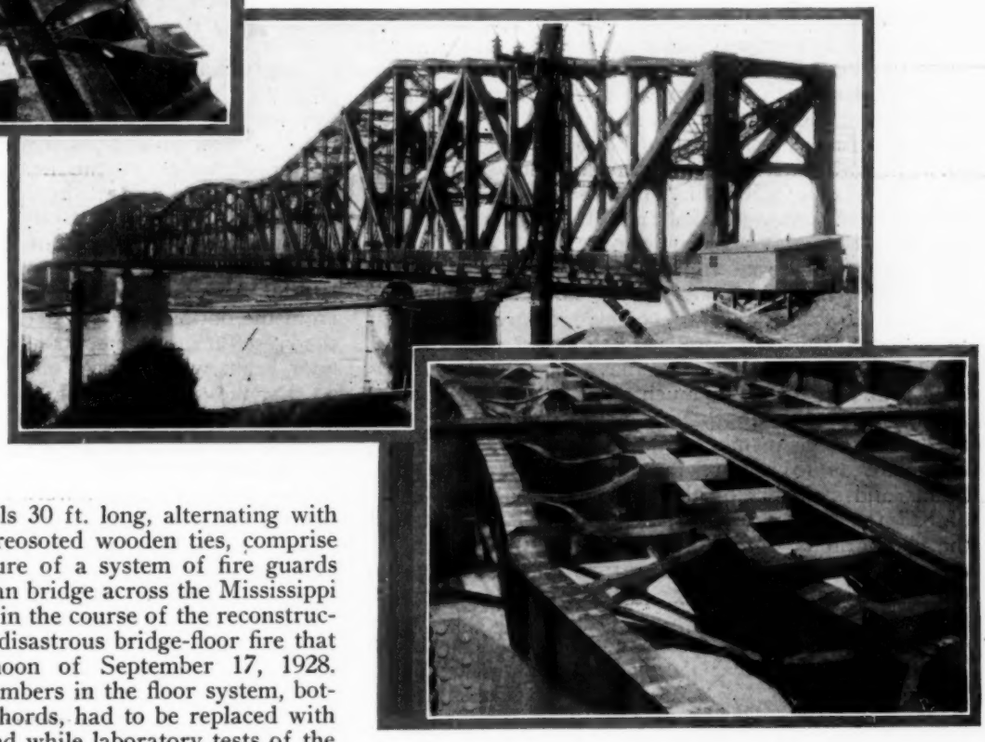
* * *

Passenger Locomotive on the Lackawanna

Heavy Repairs Required After Fire in Memphis Bridge

Erected 950 tons of new steel in floor and bottom chords and introduced fire guards in wooden deck



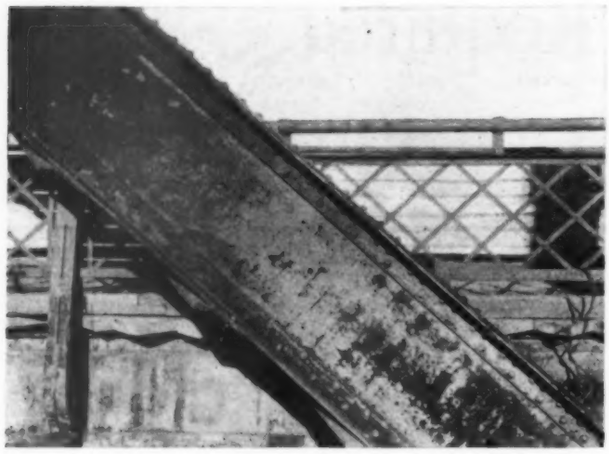


The Memphis bridge and two examples of the damage done by the fire. Above — How the outer web of a chord member was buckled. Below —Typical warping of the stringers

STEEL ties in panels 30 ft. long, alternating with 90-ft. panels of creosoted wooden ties, comprise the principal feature of a system of fire guards introduced in the Harahan bridge across the Mississippi river at Memphis, Tenn. in the course of the reconstruction work following the disastrous bridge-floor fire that occurred on the afternoon of September 17, 1928. Crippled and warped members in the floor system, bottom laterals and lower chords, had to be replaced with 950 tons of new steel, and while laboratory tests of the damaged material gave ample assurance that the physical properties of the steel in the structure were not affected by the heat of the fire, the experience proved so expensive, that it was deemed exceedingly important to provide barriers that would confine any fire in the future to a limited portion of the bridge. The cost of the fire, in terms of the outlay for repairs, was about $225,000, but this does not include the heavy expense for detouring from 90 to 100 trains daily for the period of seven and one-half weeks occupied in making the repairs.

The Harahan bridge, built in 1914-16, is the property of the Arkansas & Memphis Railway Bridge & Terminal Company, owned jointly by the Chicago, Rock Island & Pacific, the Missouri Pacific and the St. Louis Southwestern. The river crossing proper is a double-track, high-level structure of the through, pin-connected truss, cantilever type on concrete piers faced with stone masonry. The length of the main structure is 2,302 ft. and consists of four spans, of which the longest is 790 ft., 4¼ in. There is a highway, 14 ft. wide, outside of each truss supported on cantilever brackets. The railway deck is of ordinary construction with two lines of stringers under each track, carrying creosoted wooden ties. The highway floor is of 4-in. creosoted wooden planking, laid transversely, with a 1½ in. asphalt wearing surface, on wooden joints. The two highways, including the supporting floor system, was deeded some years ago to the City of Memphis, Tenn., and Crittenden county, Ark., which have assumed responsibility for the maintenance of that part of the structure.

The fire was discovered at 1:30 p.m. on September 17 in the north highway floor in the vicinity of Pier 1 (the first pier west of the east abutment). As the wind was blowing almost due south, or at right angles to the bridge, it did not influence the spread of the fire lengthwise of the structure, but by the time that the fire apparatus reached the east end of the bridge the fire had assumed such proportions that the firemen had to confine their efforts to preventing its spread eastward and



A View of One of the Main Diagonals Showing the Extent to Which the Paint Was Affected by the Fire

it was stopped at the first panel east of Pier 1. In the meantime, a fire engine loaded on a barge and two fire boats of the government dredge fleet fought the fire from the river, both by throwing streams from the decks and by carrying hose up to the bridge floor at Pier 2, where the fire was stopped in the railway deck and the north highway, after having traveled the 790 ft. from Pier 1 to Pier 2 in 50 min. In the south highway floor, the fire continued westward from Pier 2 for six panels (180 ft.) before it was put out.

Owing to the force of the wind, the heat of the fire was confined to a zone extending but little above the floor level. As seen in one of the pictures, the paint on web members apparently was not seriously affected at a height of more than 8 ft. above the deck, but it was later found to extend as much as 25 ft. inside of some hollow members. In the main, the damage was confined to the floor members and bottom laterals, and was so severe as to require the replacement of all floor beams and stringers of the railway deck for a length of 827 ft. The nature of the damage is indicated in the photographs. In addition, parts of three panels of the north bottom chord were warped to a degree requiring some repairs. The pins in the expansion joints, at the ends of the bottom chords of the suspended span, were also found to be sprung and had to be renewed. In all, it was found that 950 tons of new structural steel had to be provided for the repair of the trusses and replacements in the railway floor alone.

The problem of such replacement was complicated by the fact that all of the metal in the bridge is of special steel—high-carbon steel in the floor members and laterals and Mayori steel in the trusses. However, by reference to the plans of the bridge, it was possible to designate just what new members were required and a contract for the fabrication and erection of new steel, conforming to the same physical properties as that which it replaced, was awarded to the American Bridge Company on September 19, two days after the fire. Thirteen days later, on October 2, the bridge company's erection force was on the ground and started work cutting rivets and burning part way through the damaged members, preparatory to their renewal. The first steel was rolled on September 22, the first fabricated members were shipped on October 19, and their erection was started on October 24. By November 15 all new floor members were in place and, with bolts in 30 per cent of the holes and drift pins in the remaining 70 per cent, trains were permitted to operate over the south track (the side opposite to the truss containing the damaged bottom chord members). The second or north track could have been opened for traffic in a few days after the first track, but owing to a shortage of deck material at that time and the fact that one track was all that was necessary for the time being, the second track was not put into commission until February of this year. An idea of the work involved is indicated by the fact that 21,500 rivets were cut or burned out and 27,620 new ones driven. The force ranged from 33 to 45 men.

How the Floor System Was Renewed

The primary job of renewal had to do with the replacement of the floor and lateral members and was completed a panel at a time, from east to west. After the new steel of one panel was in place, the near ends of the stringers of the next panel, which had been burned off a foot from the floor beams, were supported temporarily by slings. Consequently, no further work was necessary at that end of the next panel when work was started on it. The first step was to burn off the lateral hangers by which the laterals were supported from the bottoms of the stringers. Next, the heads of the rivets in the connections of the stringers to the next floor beam were burned off and the rivets backed out so that the stringers could be lifted out in pairs, after which the bottom laterals were removed. Following this, the rivets in the connections of the floor beam to the posts were burned off and backed out, the stringers in the following panel were burned through one foot beyond the floor beam and the floor beam removed. In a few cases, difficulty in accomplishing this made it necessary to burn the floor beam in two.

This cleared the space for the erection of a panel of the new floor, which proceeded according to usual practice. Owing to the special design of the new floor beams it was not necessary to spring the trusses apart, in order to insert the floor beams, but in the case of the floor beam over one of the piers, where there are projecting flanges on the inside faces of the posts, it was impossible to insert the completed floor beam, and it had to be assembled in place piecemeal.

As stated previously, damage to the trusses was confined to three panels of the bottom chord of the north truss, namely, L 2—L 3 of the east cantilever, L 3—L 4 of the west cantilever and L 4—L 5 of the east half of the suspended span. These chord members are of the multiple-web type with top and bottom lacing, having

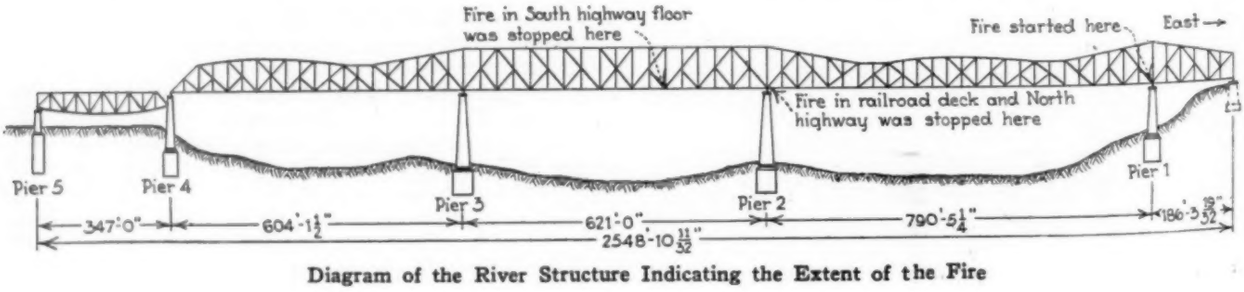
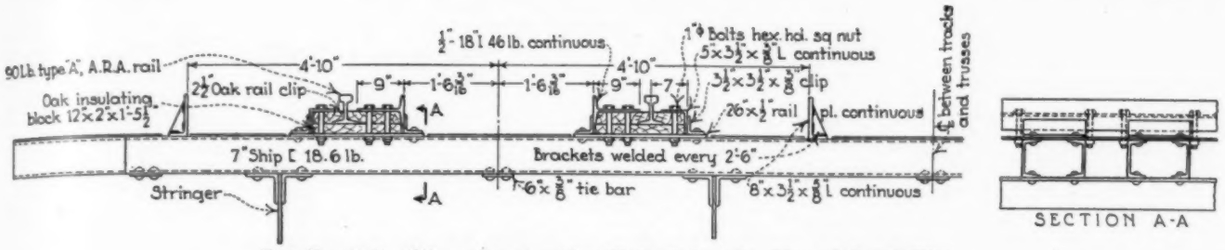


Diagram of the River Structure Indicating the Extent of the Fire



Details of the Floor Construction Embodying the Use of Steel Ties

three webs in the member in the suspended span and four webs in the two cantilevers, and, in the case of all three, damage was confined to the outer web, which was buckled as shown in the photograph, due to its attaining a higher temperature during the fire than the other webs in the chord. As a matter of fact, the span between Pier I and Pier II expanded so greatly as to exceed the allowance of six-inch travel provided in the expansion joint at each end of the suspended span and introduced enough compression in the bottom chord to bend the 4-in. pins in these joints and cause flow of metal in the webs of the chord at the pin bearing.

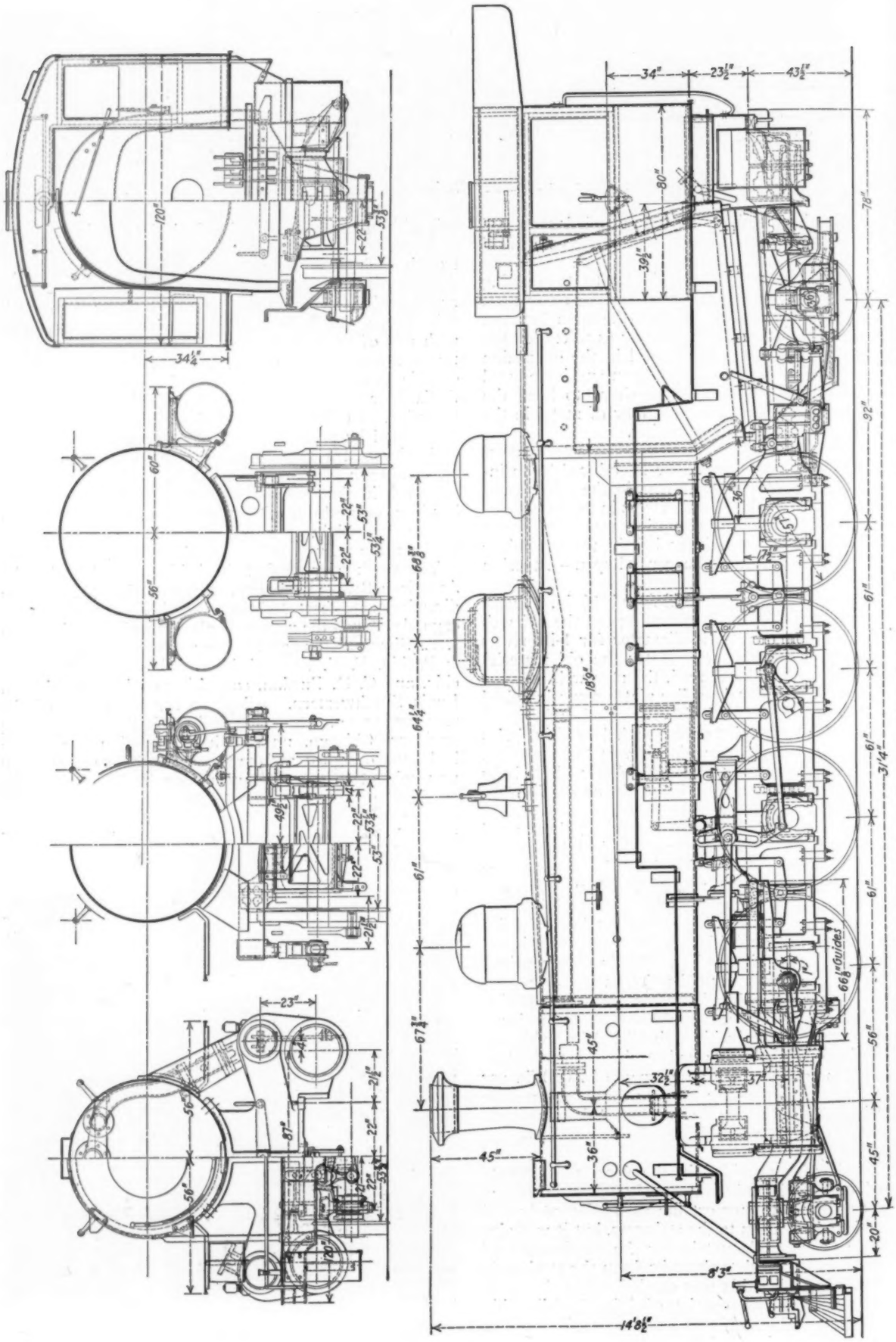
The crippled webs of the three chord members were replaced by new webs which were introduced in an ingenious way, so as to relieve stress in the other webs and introduce initial (dead-load) stress in the new webs. The manner in which this operation was carried out may be indicated by describing briefly the procedure followed in the chord in the suspended span—a tension member.

The new web member was finished ⅛ in. shorter than the gap provided for it in cutting out the old web member. Holes 1-1/16 in. in diameter for 1-in. rivets were provided in the splices. After the old material had been cut away and removed, the new web member was lifted into place and the splice plates securely bolted and pinned to it. Then with the new member drawn to a close bearing at the joint on one end, 1-1/16-in. holes were drilled in the web to which it was to be spliced, using the splice plates as templates. After ⅞ in. bolts and pins were inserted in these holes, the new web member was wedged toward the opposite joint as far as the play in the 1-1/16-in. holes, filled with ⅞-in. pins, would permit and while the member was held in this position 1-1/16-in. holes were drilled for the splice at the other end of the member and fully riveted. Then, by replacing the ⅞-in.-pins in the holes in the opposite joint with 1-1/16-in. pins and driving these up to get fair holes for driving 1-in.-rivets, an initial tensile stress was introduced into the new web member. Strain-gage readings taken on the two remaining old webs, as well as on the new web, before and after inserting the new material, showed that the tension in the middle web was reduced 312,000 lb., and in the inside web 62,000 lb., while an initial tension of 370,000 lb. was introduced into the new web, which is equivalent to an average of 7,000 lb. per sq. in. In a corresponding manner, unit compressive stresses of 7,200 lb. per sq. in. and 6,650 lb. per sq. in. respectively, were introduced into the new webs of the compression members.

The fire barrier provided in the form of alternate panels of steel ties introduced several problems. It was necessary not only to support the rails adequately and transmit the wheel loads to the stringers, but it was also required to provide adequately for the contingency of derailments and to insulate the rails from the steelwork. The manner in which this was carried out is shown in the drawing. The ties consist of 7-in. 18.6-lb. ship channels, spaced alternately 12 in. and 7¾ in. back to back, arranged in pairs, and covered in the line of each rail with a continuous longitudinal plate 26 in. wide by ½ in. thick. Over this plate is provided a steel box or trough made of angles and half of a split 18-in. I-beam (which acts as an inner guard rail) this box to serve as an enclosure for an oak bearing block and two oak rail clips, which hold the rail in place without contact with any of the bridge steel. The tops of the ties between the rail supports and between the rails and the outside guard angles, are covered with checkered Illinois floor plates, 27 in. wide by ¼ in. thick, to serve as walks. In the highway deck, fire breaks have been introduced by providing a diaphragm of steel plates at each pier and a diaphragm of transite asbestos board opposite each panel of steel ties in the track roadway. All work in the restoration of the two highway decks, has been carried out under the supervision of the Tennessee state highway authorities, independently of the work on the railway portion of the bridge.

The work of restoring the bridge was done by the American Bridge Company, whose engineers, under the direction of Albert Reichman, division engineer, Chicago, developed the necessary plans in collaboration with I. L. Simmons, bridge engineer, Chicago, Rock Island & Pacific, F. E. Bates, bridge engineer, Missouri Pacific, and C. D. Purdon, consulting engineer of the St. Louis Southwestern. All plans for the repair of the structure were approved by Ralph Modjeski, consulting engineer, Chicago, under whose direction the bridge had been designed and constructed. The entire work was subject to general supervision by W. S. Martin, president of the Arkansas & Memphis Railway Bridge & Terminal Company. K. G. Williams, division engineer of the terminal company, supervised the work of the company forces in replacing the tracks.

Condition of the Floor System for the South Highway After the Fire



Elevation and Cross Section Drawings of the Light 2-8-2 Type Built for the Georgia Northern by the Baldwin Locomotive Works

Mikado Type Locomotive of Welded Construction Built for the Georgia Northern by the Baldwin Locomotive Works

Mikado Type Locomotive for the Georgia Northern

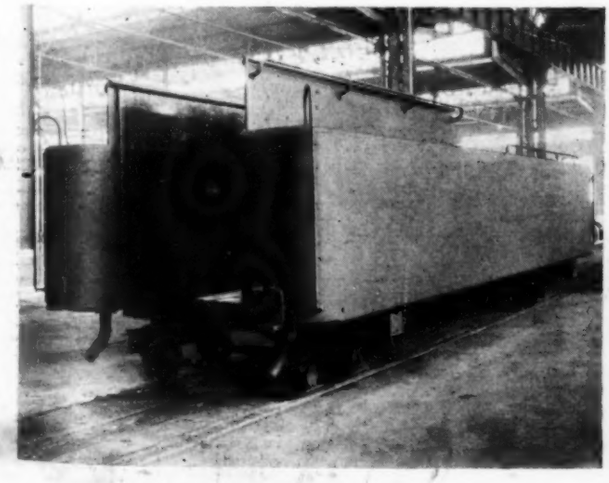
Welding of locomotive- and tender-frame connections eliminates many bolts and rivets

THE Baldwin Locomotive Works recently delivered a 2-8-2 type locomotive to the Georgia Northern in the construction of which a large number of welded connections were made with the object of eliminating the use of bolts or rivets as much as possible. In addition, considerable attention was given by the designers toward improving the appearance of the locomotive. The locomotive is finished with Duco lacquer of royal blue. Monel metal is used for the jacket bands and cylinder casings; the smoke-stack top, letters and numbers are of chromium-nickel. The main and side rods are polished.

The Georgia Northern operates between Albany, Ga., and Boston, a distance of 67.5 miles, making connections at the first-named point with the Central of Georgia, Atlantic Coast Line, Seaboard Air Line and the Georgia, Southwestern & Gulf; and at the latter point with the Atlantic Coast Line. Connections are also made at Moultrie, Ga., with the Atlanta, Birmingham & Coast, and with the Georgia & Florida. This locomotive is being used in freight service, and has 57-in. drivers, cylinders 20 in. in diameter by 28 in. stroke and the boiler operates at a pressure of 200 lb. per sq. in. The engine weighs 189,470 lb., of which 136,260 lb. is carried on the drivers. The tractive force is 33,400 lb. and the factor of adhesion, 4.08. A weight of 33,310 lb. is carried on the trailing truck, and 19,900 lb. on the engine truck. The total weight of the engine and tender is 330,400 lb. The tender has a water capacity of 7,000 gal. and a fuel capacity of 12 tons. Other dimensions, weights and proportions are shown in the table.

The Welded Construction

Four of the illustrations show the amount and character of the welding that was done on this locomotive. All of the cross-ties, which are of cast steel, are welded



The Welded Tank Before Being Applied to the Underframe

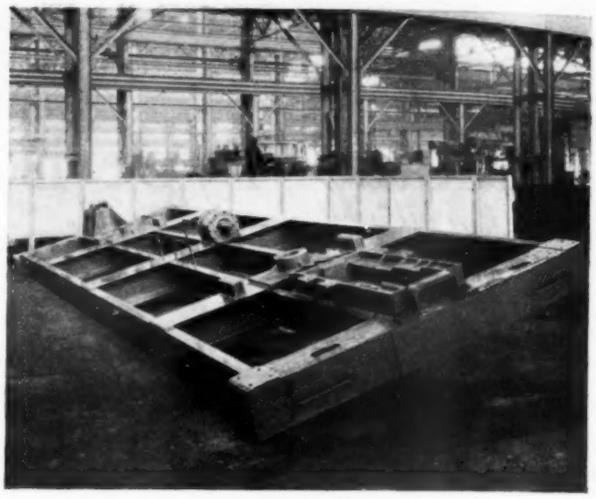
Absence of Rivets Gives a Smooth and Pleasing Appearance to the Cab

to the main frames. The front and rear bumpers on both the locomotive and tender frames are welded, as shown. The guide yoke, link bearing and knees are attached to the side of the frames by welding. The running board edge is welded to the running-board floor plate. The locomotive frames contain no bolts, except where the cylinders are attached, and where the pedestal binders are secured under the driving boxes.

Both the cab and tender body are of welded construction, which gives them a smooth and pleasing appearance owing to the absence of rivet heads. The pilot is constructed of 2-in. by 2-in. by ¼-in. angles welded to a frame of 3-in. by 3-in. by ½-in. angles. The frame angles are welded together, but the pilot is bolted to the bumper. An interesting feature in the construction of the tender frame is the welding of the draft sills, the body center plates, brake cylinder, brake lever hangars, and drawbar connection, direct to the tender frame. It will be noted from the illustration that only the drawbar carry iron and end-sill hand holds are bolted to the frame.

Table of Dimensions, Weights and Proportions of the Georgia Northern 2-8-2 Type Locomotive

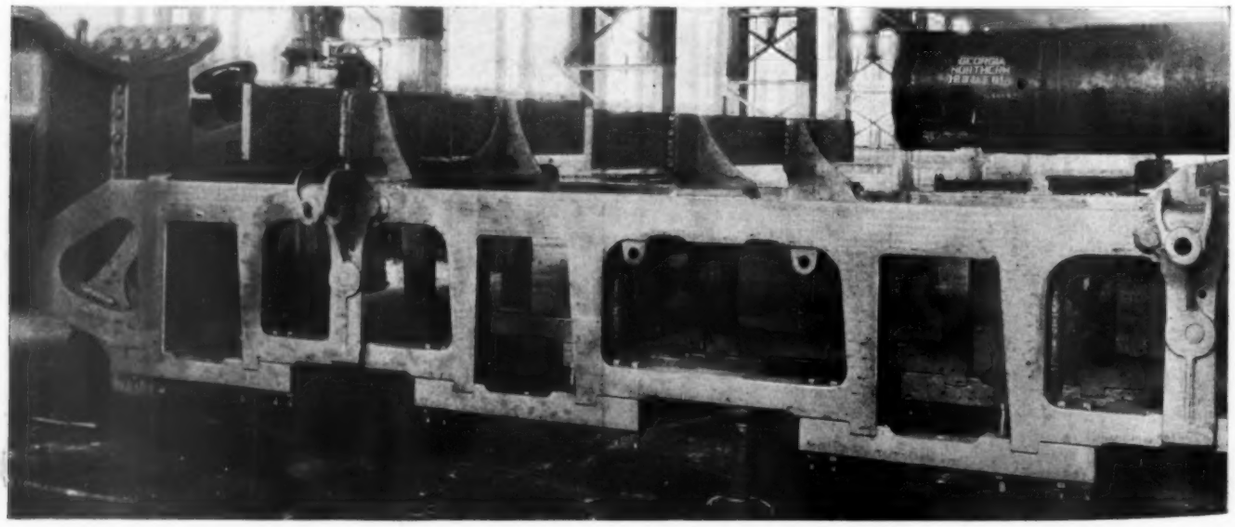
Railroad	Georgia Northern
Builder	Baldwin Locomotive Works
Service	Freight
Cylinders, diameter and stroke	20 in. by 28 in.
Valve gear, type	Walschaert
Valves, piston type, size	10 in.
Weights in working order:	
On drivers	136,260 lb.
On front truck	19,900 lb.
On trailing truck	33,310 lb.
Total engine	189,470 lb.
Total engine and tender	330,400 lb.
Wheel bases:	
Driving	15 ft. 3 in.
Total engine	31 ft. 4 in.
Total engine and tender	65 ft. 5½ in.
Wheels, diameter outside tires:	
Driving	57 in.
Front truck	30 in.
Trailing truck	36 in.
Journals, diameter and length:	
Driving, main	9 in. by 10 in.
Driving, others	8½ in. by 10 in.
Front truck	5½ in. by 10 in.
Trailing truck	6 in. by 11 in.
Boiler:	
Type	Wagon top
Steam pressure	200 lb.
Fuel	Soft coal
Diameter, first ring inside	64 in.
Firebox, length and width	96¼ in. by 66¼ in.
Tubes, number and diameter	162—2 in.
Flues, number and diameter	28—5⅜ in.
Length over tube sheets	18 ft. 9 in.
Grate area	41.5 sq. ft.
Heating surfaces:	
Firebox	148 sq. ft.
Tues and flues	2,318 sq. ft.
Arch tubes	16 sq. ft.
Total evaporative	2,482 sq. ft.
Superheating	603 square ft.
Combined evaporative and superheating	3,085 sq. ft.
Tender:	
Water capacity	7,000 gal.
Fuel capacity	12 tons
Wheels, diameter outside tires	33 in.
Journals, diameter and length	5½ in. by 10 in.
Maximum rated tractive force	33,400 lb.
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent	72.0
Weight on drivers ÷ tractive force	4.08
Total weight engine ÷ comb. heating surface	61.4
Boiler proportions:	
Tractive force ÷ combined heating surface	10.82
Tractive force × diam. drivers ÷ comb. heating surface	617.5
Firebox heating surface, per cent of evaporating heat. surface	5.96



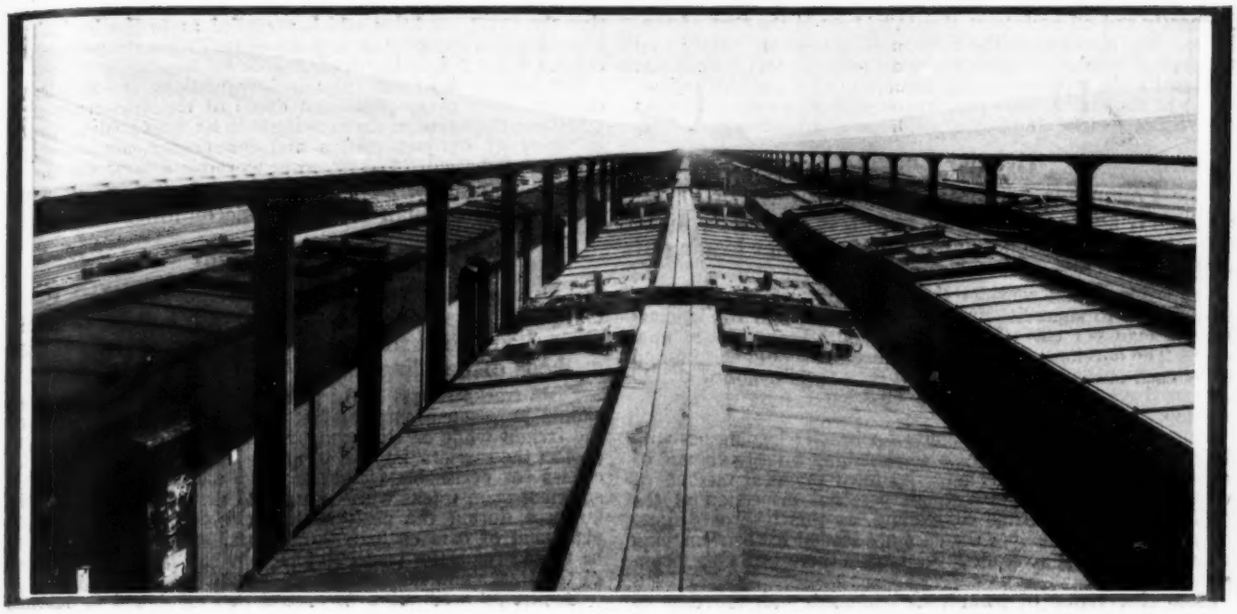
The Tender Underframe

The absence of rivet heads on the exteriors of both the locomotive and tender lends considerable to the appearance of a somewhat elaborate finish and decoration.

The locomotive is equipped with a Type A superheater, power reverse gear, and two 9½-in air compressors.



The Frames With Welded Attachments



Freight Station Section Meets

Denver convention brings out much new material as to operating methods

SOME 500 members were in attendance at the ninth annual session of the Freight Station Section, A. R. A., when Chairman J. H. Rogers, agent, Long Island, called the meeting to order in Denver, Colo., on June 18. The four-day session this year was unusually productive of results, and the reports of the committees were thorough and comprehensive, and the discussion lively and informative.

The Committee on Operating, of which J. R. Hitchcock, assistant agent, Atchison, Topeka & Santa Fe is chairman, stressed the importance of providing an agent with cost and performance figures as an aid to supervision. It was the consensus that daily figures should be supplied to each agent, showing the revenue, cost, delays and errors at his station, so that he might exercise greater control over his operations.

Cooperage Expense

The report stated that, in the Chicago terminals alone, the railways are expending $10,000 monthly on cooperage service, not including the cost of tools and supplies. The report continued:

The situation at Chicago is comparable, on a tonnage basis, with that of many other cities, so that if the total cost were added to claim payments the ratio of loss and damage to revenue would be higher than is reported. The committee believes that if the Freight Claim Division would include in its reports an item representing the cost of this service, it would attract such attenton from all railroads that concerted corrective action would result.

The ratio of responsibility between manufacturers of containers, shippers and transportation agencies is not fixed. It is certain that the railroads are contributing to the burden of recoopering by accepting shipments not complying with classification requirements, by not properly loading cars to avoid damage of one class of freight or containers by another, by not properly trimming down loads, by dirty and improperly prepared cars, and damage on the docks and platforms. Any improvements or corrections of these conditions is wholly in the hands of the transportation companies and we, therefore, recommend that agents personally familiarize themselves as to such conditions at their stations and take corrective action. When this has been accomplished, manufacturers and shippers may be impressed with their responsibility.

In order that a correct analysis of the problem may then be obtained, agents should maintain such records as will permit a proper allocation of responsibility. Reports from various stations and sectional committees invariably indicate that the re-used container is the largest contributing factor in recoopering and invoicing. Your committee believes that re-used containers should be subject to definite and specific tariff and classification requirements beyond those now required for new containers.

The importance of prompt repairs to defects in containers should not be minimized as the continued stress in transit increases the opportunity for theft or damage to contents. All transfer stations should recognize the possibilities resulting from defective containers and properly recondition them. There is a general disposition to pass damaged containers along and leave it to destination stations to recooper and invoice. Agents should not permit this.

Reporting on safety in freight-house operation, the committee emphasized the following points:

The usual precautionary measures should be taken to prevent and to avoid accidents of the ordinary kind, such as stepping on loose nails, tripping over pieces of crating, blocking, etc., which have no place in a well-organized freight house.

To prevent minor causes of accidents, it is obvious that warehouse floors should be kept clean, protruding nails and spikes removed from floors and the sides of cars. Running boards should be inspected and tested carefully, and these are duties that should be assumed by the foreman and assistant foreman.

The prime essential in the matter of safety, is a well-organized force. These forces are divided into gangs, consisting of check clerks, callers, truckers and stowers; and the check clerks and callers being men of long experience, usually advancing from the ranks, have knowledge and experience in handling various classes of freight that enables them properly to supervise the work of others. This should prevent accidents which might occur through inexperience. Special supervision by the foreman and his assistant should be given to avoid damage or accidents when handling freight other than the ordinary.

Warehouse facilities and equipment should be inspected

frequently and all equipment should be kept in the best of condition. We recommend the holding of warehouse safety first meetings at regular intervals wherever possible, and believe that continual close supervision and the desire of the entire organization to eliminate unsafe practices as well as unsafe conditions will reduce freight warehouse accidents to a minimum.

Heavier Loading

The Committee on Station Traffic, of which O. M. Hullinger, agent, Michigan Central, is chairman, made the following recommendations as to heavier loading of equipment:

The roads should consider the advisability of setting up an organization to supervise and direct the campaign for increasing the load per car where such organization does not now exist. The development of this organization should be followed up by each individual road, or such data as is obtained should be passed on to the Car Service Division for its use or disposition.

The more immediate opportunity for heavier loading lies with the shippers and receivers who are handling a large volume of carload shipments. We believe the most practical method of handling this problem is through personal inspection at the loading point at the time of loading, as this insures definite information as to whether the cars are loaded to their carrying capacity and if not so loaded, the reason therefor. Other suggestions are:

Close observation of team-track operation with the view of speeding up the loading and unloading.

Close supervision on part of station forces and co-operation with yard forces to have the smaller and lower capacity cars placed for light merchandise loading at outbound freight houses, transfer stations and team tracks.

Close contact with outer yards to secure prompt placing and disposal of loaded cars.

Encourage standing orders to aid in the prompt placing of cars for unloading.

Request for home routes of loaded foreign cars as soon as they are received so that they can be disposed of soon as they are emptied, if no loading is available.

Prompt and frequent requests for home routes of empty foreign cars received unrouted.

Reciprocal arrangements at junction points for the short hauling of empty foreign cars.

When cars loaded on connecting lines are delivered to the road haul carrier accompanied by an interline switch bill, all information shown on the shipping order should be shown on the interline switch bill so that in case the shipping instructions are delayed in reaching the billing office, waybills may be made from the interline switch bills to advance the movement of the car.

The committee also reported against the advisability of making a charge for telegraphing in connection with diversions.

Demurrage

The Committee on Station Accounting, of which J. H. Mahoney, agent, Chicago & North Western is chairman, reported on the proper organization of demurrage departments for local freight offices, as follows:

We recognize the prime importance of having demurrage records handled by well trained employees and, where the volume of business warrants, we believe the best results can be accomplished through a separate department of the station organization. The decision as to which particular department of the station should handle the work we would leave to the judgment of the agent in charge.

Demurrage rules were designed only as a means to the end of securing a reasonably prompt release of cars by shippers and consignees. The methods of accounting for the delay are approved by the highest authorities. Demurrage tariffs are uniform, but the methods of compiling the records and the detail work connected therewith vary greatly according to the system of accounting in use on the different railroads.

The successful carrying out of demurrage rules and assessments depends on the accuracy of the station records which are kept in the ordinary course of handling. These include the time of arrival, notice of arrival, time ordered, railroad detention and time placed, as well as the serving of constructive placement notices at the proper time, as required.

The track record and notice record are the foundation of all demurrage assessments. The track records must be made accurately and legibly and with sufficient detail to show the exact situation existing at the time the record is made. This record must be so complete that anyone may know from its inspection the exact condition which prevailed as to the load, date, hour, position of the load and the name of person making the check.

We believe the tariff rules and regulations are sufficiently clear to cover every phase and detail of the demurrage situation and the question resolves itself in its final analysis to the efficiency of our supervision and the proper education and training of the individual employee as to his specific duties.

This committee also reported in favor of zone accounting rather than centralized accounting.

Perishable Freight

The Committee on Perishable Freight, of which E. H. Osterhout, assistant agent, Atchison, Topeka & Santa Fe is chairman, made the following report on the proper methods of handling:

Team tracks should be located conveniently and the patrons should be given prompt and efficient service. Deliveries, and the freight while on the team track should be handled so as to protect the carriers' interest to the fullest extent. Terminal facilities for perishable freight at large markets should provide sufficient team tracks with wide paved driveways to handle the business during the peak season and permit the immediate placement of cars on arrival. If possible, team tracks should be fenced for better protection, thereby simplifying the policing of the tracks and the delivery of freight.

Immediate notification of arrival and placement is essential and to make this possible, an arrangement with the local trade should be devised to accept notification by telephone or by some form of memorandum, which can be delivered quickly to the consignee, this notification to show the information required by the demurrage tariff.

Maintaining of arrival seal records until unloading has commenced is essential. In some markets, the cars are sealed each evening, while, in others, the sealing after the car is in the process of unloading is handled by the consignee, who applies his private lock or seal. It is desirable, when cars are not being opened for inspection or in actual process of being unloaded, that they be kept under seal, and that after delivery and while in the process of unloading, the car should be sealed after each load, if left for the carrier to protect. A complete record of all seals removed and applied should be kept until the cars are emptied.

Prior to shifting cars in the afternoon or evening, the consignee should be required to step down the load and brace the lading to prevent shifting during the breaking up of yards, and delivery clerks in charge of team tracks should examine the cars prior to shifting to insure that this practice is being followed by the consignee. Otherwise, the carriers should protect the lading to the best of their ability, but in case of damage because of the consignee's failure to protect, the lading responsibility should be declined.

Cars should be placed on the team track with the required amount of ice in the bunkers and the daily record maintained as to the amount of ice in the tanks and the position of ventilators and plugs, and additional ice should be added in accordance with tariff provisions. The perishable protective tariff requires ice to be furnished by the carrier only while the lading is intact, or prior to the time the consignee places his private locks or seals on the car. This also applies to the manipulation of ventilators. During extremely low temperatures every protection possible should be given to cars on the tracks.

The report of the Committee on Freight Claim Prevention, of which C. P. Varney, agent, Chicago, Rock Island & Pacific, is chairman, confined its report principally to methods of avoiding damage claims on shipments of live stock, urging that an educational campaign be undertaken in this regard.

The following officers were elected: W. H. George, Chicago & Alton, chairman, and G. R. Littell, agent, Baltimore & Ohio, vice-chairman. On the executive committee, J. B. O'Brien, agent, New York, New Haven & Hartford, was selected to represent the New England district; C. C. Kinney, agent, Pennsylvania, the Eastern district; M. G. Carson, agent, Cleveland, Cincinnati, Chicago & St. Louis, the Southeastern district; O. M. Hullinger, agent, Michigan Central, the Central district; J. H. Mahoney, agent, Chicago & North Western, the Northwestern district; E. L. Begun, agent, Union Pacific, Pacific Coast district; and A. M. Adams, general agent, Canadian National, Northern district.

Readjustment of Iron and Steel Rates Prescribed

Lower rates on mileage basis ordered by I. C. C. under Hoch-Smith resolution

WASHINGTON, D. C.

A REDUCTION in railroad revenues from iron and steel traffic in Official Classification territory, estimated by Commissioner Woodlock to amount to $2,500,000 or more a year, and objected to by three other commissioners as unwarranted, is expected to be the result of a new mileage scale basis prescribed by the Interstate Commerce Commission in Part 6 of its general Rate Structure Investigation under the Hoch-Smith resolution, made public on June 22. This is the second part of the Hoch-Smith investigation, which was instituted March 12, 1925, to reach the stage of a report and order, the first being that in Part 11, applying to sand, gravel and similar commodities in the Southwest, on which the commission issued a report on June 17, also prescribing a mileage scale.

A uniform mileage scale of maximum rates, ranging from 6 cents per 100 pounds for the first 5 miles up to 56 cents for 1,200 miles, is prescribed, to become effective on or before October 20, for application in Official Classification territory, and another scale, ranging from 6.5 cents for 5 miles up to 45 cents for 700 miles, about 10 per cent higher than the basic scale, is prescribed for application in New England.

"The record leaves no doubt," the majority report by Commissioner Campbell says, "as to the need and desirability of a thorough revision of the rate structure here under investigation. Aside from the question of whether the present rates considered as a whole are upon the proper level, there is disclosed an utter lack of consistency and orderly arrangement, accompanied by many instances of unlawful prejudice and preference which should be removed.

"The failure of the present rates to meet the requirements of the law in this respect was alleged or conceded generally by both shippers and carriers. The various proposals submitted, although differing widely as to the rate level, are in each instance designed to remove inconsistencies and to produce a more harmonious rate structure." The new scale is to take the place of rates now largely on a fifth-class basis, although there are many commodity rates and other departures from that general level, and various scales as well as point-to-point and group rates now in effect.

As to the general level of the scale the report says: "A comparison of rates on steel with rates on other commodities which move at fifth-class rates or less, the large and constant volume in which it moves, its heavy loading, the very small risk in connection with its transportation, and its small value per weight unit, all are persuasive that the general level of rates should be lower than the present fifth class. This is especially true of hauls up to 200 miles. . . . It is our duty in this proceeding to fix maximum reasonable and otherwise lawful rates on steel, even though the resulting gross revenue is less than that received from the present rates. While the record does not warrant as great reductions as would result from the application of scales proposed by shippers other than the Chicago independents and the Bethlehem Steel Company, it abundantly shows that fifth class is not the proper basis for this traffic, and that rates somewhat lower than the present rates on steel considered as a whole should be prescribed."

Four Commissioners Object to Reduction

Although concurring in the report, four commissioners criticised it because the scale prescribed would reduce carrier revenues on this class of traffic, and Commissioner Eastman objected because interterritorial rates to and from New England were not made somewhat higher. Commissioner McManamy said he knew of "no transportation or other reason which justifies the reduction in carriers' revenues which will result from the establishment of the rates here prescribed," saying that "there is no depression in the steel industry" and that "in view of the need for careful consideration of the level of rates on agricultural commodities and livestock, the carriers' revenues should be protected in this case." He also disagreed with the establishment of a basic scale which is relatively lower for short hauls than for long hauls, saying that both of the objections would be removed by appropriate increases in the scale for distances up to 400 miles.

Commissioner Woodlock, in a separate opinion concurring in part, in which Commissioners Taylor and Porter joined, said:

> I concur in the report in the instant case in all particulars except in the level of the scale prescribed. The record indicates that prescription of this scale will reduce carrier revenues in an amount of, probably, not less than $2,500,000 and perhaps more. In my opinion we are not warranted in reducing revenues on this traffic by one penny. This is a Hoch-Smith proceeding. The record shows that inequalities in existing rates and not rates in themselves too high are the sources of the complaints. It shows that iron and steel products move with great freedom all over the region. It shows that these commodities can easily carry rates which, measured by transportation conditions alone, would seem relatively high. The heart of the Hoch-Smith resolution is the principle that the total transportation burden of the region shall be distributed over the commodities moving in that region in proportion to the ability of each commodity to bear that burden. If the resolution does not mean that what does it mean? The total transportation burden of the region is determined by the revenue needs of the regional carriers and the measure of these needs is the "fair return" on their value, for without that fair return the "maintenance of an adequate system of transportation" is impossible. If that be not the meaning of those words, twice repeated, in the resolution, then what do they mean? What warrant, therefore, is there for reducing the rates on commodities such as these in official territory where the carriers are not at present earning more than the fair rate of return (prescribed by us) upon anything which can be said to be their fair value? Commissioners Taylor and Porter join in this concurring expression.

The new scales are made subject to a minimum weight of 40,000 pounds, in place of the present minimum of 36,000 pounds. The report says the average loading has been nearly twice the present minimum. While the scales prescribed are for maximum rates, and the commission declined to prescribe minimum rates, it expressed the opinion that departures from the scale

should be made only when there is important necessity therefor, and only when such departures can be fully justified under section 3 of the interstate commerce act. Distances are to be computed on the basis of the shortest routes over which carload traffic can be moved without transfer of lading. Reasonable grouping will be permitted, the report says, and a basing-point system such as that now used in connection with the C.F.A. class scale.

Rates Not Unreasonable in Past

In denying certain applications of shippers for reparation covering past shipments the report says that "under the circumstances, the rates cannot be considered to have been unreasonable in the past." It points out that the commission has generally recognized that substantial justice would not be advanced by awarding reparation in cases where, as in this proceeding, a general readjustment of rates is made covering a wide area and resulting in both increases and reductions. Furthermore, it is stated, many of the rates under consideration were either prescribed or approved by the commission in prior proceedings but upon much smaller records.

Therefore the finding is that rates applicable on the list of iron and steel articles given in an appendix "were not and are not, but for the future will be, unjust and unreasonable to the extent that they exceed or may exceed the rates in cents per 100 pounds set forth in Appendix F."

Fifteen complaints, three investigation and suspension proceedings, and one petition under section 13 of the interstate commerce act, all of which put in issue rates on manufactured iron and steel articles from and to various points in Official Classification territory, were assigned for hearing in connection with the general investigation. The report states that over 90 per cent of the steel of the United States is produced within the territory covered, generally east of the Mississippi river and north of the Ohio.

Shippers Object to Fifth-Class Basis

Attacks by shippers upon the present rates on the ground of unreasonableness were directed principally, the report says, against the application of fifth-class rates on steel articles and against the commodity rates established pursuant to the decision in Docket No. 15110. The carriers, according to the report, do not deny that the general level of rates on steel is relatively high if transportation characteristics alone are considered. They admit that a substantial profit is derived from steel and that it is desirable traffic. Their position with reference to the reasonableness of the steel rates in general is stated as follows: "(1) The carriers' profits as a whole do not afford them more than a reasonable return; and (2) the steel rates are not too high when, in addition to transportation characteristics, consideration is given to the value of the service, or in other words to what the traffic will bear."

"While the record contains a considerable amount of evidence intended to prove that the general level of steel rates is too high," the report says, "it indicates clearly that the level of the rates is of much less importance to shippers generally than is their relationship. . . . The carriers do not deny that the present rate structure contains many instances of improperly related rates. Their chief concern is lest, in removing the admitted inconsistencies, their revenues should be impaired." "Various rate scales were proposed by shippers at the hearings and the carriers proposed different rate levels within the various rate territories and interterritorially, without, however," the report says, "offering any evidence directed specifically in opposition to a uniform rate structure."

The general expressions and conclusions of the report include the following:

Both the carriers and the shippers emphasize the provisions of the Hoch-Smith resolution. No depression, such as is quite generally urged on behalf of agricultural and livestock interests, is apparent in the steel industry. On the contrary, the industry, generally speaking, is in a prosperous condition and the commodities under consideration move freely. The shippers, however, urge that under the provisions of the resolution it is our duty to distribute the burden of all rates on sound economic principles and to give to the general public the benefit of competitive rates on freight from all producing districts; that it contemplates the development of the industry, and that no commodity shall bear an unfair portion of the transportation burden. The carriers, on the other hand, while admitting certain irregularities in the present rate structure, are not asking for general increases in the rates but contend that in ironing out these irregularities their existing revenues from this steel traffic must be maintained.

We are directed by the resolution to distribute the burden of the transportation charges equitably "as between the various localities and parts of the country, the various classes of traffic, and the various classes and kinds of commodities," having due regard to the natural and proper development of the country as a whole and to the maintenance of an adequate system of transportation. It is evident that in the accomplishment of this task the principle of what the traffic can or will bear is a factor which must be given due consideration. In other words, if agricultural products and livestock are to receive the benefit of the lowest possible lawful rates compatible with the maintenance of adequate transportation service, commodities, such as the iron and steel articles here under consideration, which are able to bear relatively high rates, must be accorded rates which approach but which do not exceed reasonable maxima. . . .

The record shows that producers of manufactured steel are located in almost all parts of official territory and that such producers are in keen competition one with another for trade practically throughout the territory. It is further shown that actual or potential consumers of steel in carloads are located in every town or city of appreciable size, and that in many instances such consumers are in competition with each other. When such a situation exists it is obvious that, except where appreciable differences in traffic and transportation conditions appear, a uniform rate level properly adjusted as between long hauls and short hauls is required if undue prejudice and preference are to be avoided. Cost of construction is heavier and operating conditions are more severe in trunk-line than in central territory due to the mountain ranges which traverse the former; but this disadvantage of the trunk lines is probably fully compensated by their greater traffic density. The average levels of steel rates in the two territories seem to be nearly the same, although in the present state of the rate structure it is impossible to determine this accurately. It is noteworthy that the basic scale proposed by the trunk lines is lower for the distances over which the heaviest traffic moves than the scale proposed by the central carriers generally, although slightly higher than that proposed by the Illinois rate-committee lines. Considered as a whole, the evidence is persuasive that, with certain exceptions to be discussed hereafter, rates on manufactured steel should be on a uniform level throughout the territory under consideration.

That the needed rate revision should be based on a distance scale or scales is so strongly indicated by the record as to require little discussion. The majority of the proposals submitted by both shippers and carriers took that form. The most important exception was the proposal of the carriers to retain the McGraham percentage formula in constructing interterritorial rates. However, representatives of some of the largest shippers strongly opposed its retention and none of them appeared in its defense. Under the system of distance rates herein prescribed the necessity for such a connecting link disappears.

The proposals of the carriers, if adopted, would result generally in increasing the present rate level. Those of the shippers for the most part contemplate reductions, and many of them would make heavy inroads into the carriers' revenues from the steel traffic. . . .

The carriers other than those operating within New England, do not seriously urge that this traffic should produce more revenue than at present but do contend strenuously that no general reduction in the present rates is justified. While admitting that the present level of steel rates is high, considered solely from a cost of transportation standpoint, they defend this level on the ground that the traffic is moving freely under those rates and that, therefore, so long as the carriers are earning

less than the statutory fair return, no reduction in the revenues from this source should be made. . . .

A basing-point system such as that now in use in central territory in connection with the C. F. A. class scale and as proposed by the trunk lines in this proceeding simplifies materially the publication of rates under a distance scale and is not subject to the same objections as extensive grouping, particularly in connection with comparatively short hauls. In establishing rates to or from points which are not grouped representative basing points may be selected which should include most of the common or junction points and in addition a sufficient number of local and termini points so that the distance between basing points shall not in any instance exceed 20 miles. Rates between basing points should be the scale rates for the distances between such points ascertained in accordance with the distance formula prescribed herein. Joint rates to and from stations which are not basing points should be based on the distance to or from the more distant of the two basing points between which such stations are located, but where both origin and destination are on a single line the rate for the actual distance must not be exceeded.

I. C. C. Valuation of Pennsylvania Properties

WASHINGTON, D. C.

THE Interstate Commerce Commission on June 19 made public its pre-war and "pre-O'Fallon" final valuation reports covering 68 of the companies in the Pennsylvania Railroad System as of basic valuation dates ranging from June 30, 1916, to June 30, 1918, stating final values amounting to $1,844,088,951, as contrasted with the total property investment of the 68 companies as of the dates used amounting to $1,681,210,084. The reports, with appendices, include a total of 2363 printed pages, and include the major properties of the system, but they do not include 19 companies for which the commission had previously issued final valuations amounting to $40,879,208 or 11 companies for which tentative valuations had previously been issued, amounting to $127,232,654, but for which final valuations had not been issued. These added to the $1,844,088,951 would make a total of $2,012,200,813 for the 98 companies.

Thomas W. Hulme, vice-president of the Pennsylvania, issued a statement pointing out that the findings of value are for a period 10 to 15 years ago and are not reflective of present conditions, that they are dated January 15, prior to the decision of the Supreme Court in the O'Fallon recapture case on May 20, and that since the dates of valuation there was expended on the companies in the Pennsylvania Railroad the sum of $715,053,038 for additions and betterments not included in the commission reports.

He also pointed out that the valuations found do not include the value of securities, then owned, of corporations not operated as a portion of the Pennsylvania system, which cost $157,732,530, nor the value of non-carrier properties amounting to $52,883,393, making total assets of $2,222,816,736, which he said may be contracted with a then total of the issued stocks and bonds of $1,865,823,469, of which $485,418,216 was held in the companies' treasuries, leaving then outstanding in the hands of the public $1,380,405,252.

The valuations of the 68 companies were published in two separate reports, one for the Pennsylvania Railroad et al, Valuation Docket No. 928, embracing 57 companies having a total of 12,278 miles of main line, and one for the Pittsburgh, Cincinnati, Chicago & St. Louis et al, including the Vandalia, Valuation Docket No. 362, which together owned and used 3,766 miles of line. The total final value for rate-making purposes of the various carriers embraced in Valuation Docket No. 928, used by the respective carriers for common-carrier purposes, was found to be $1,612,114,371, including $53,505,168 for working capital, as of 1916, 1917 or 1918. The total final value for rate-making purposes of the 11 carriers embraced in Valuation Docket No. 362 was placed at $231,974,580, including $5,280,900 for working capital, as of 1916.

The tentative valuation of the Pennsylvania Railroad and the other companies embraced in its report had been placed at $1,583,469,948. The companies contended that the cost of reproduction new estimates were $95,000,000 too low; that estimates for cost of reproduction less depreciation should be substantially the same as the cost of reproduction new and that the going concern value of the Pennsylvania Railroad should be fixed at at least $100,000,000. As the result of conferences increases were made in the estimated cost of reproduction new which total approximately $43,400,000 or less than 3 per cent of the total.

After a consideration of the various points of protest the commission found the final value of the property owned and used for common-carrier purposes by the Pennsylvania Railroad as of 1918 was $776,775,000, while that of the property owned but not used was $10,420,747, and that of the property used but not owned was $321,734,428. Separate figures are given for the other companies.

The tentative valuation for the Panhandle and other companies embraced in its report, as of 1916, was $227,930,863. The commission finds the final value for the property owned and used by the Panhandle to have been $148,135,900, that of the property owned but not used $353,881, and that of the property used but not owned $38,969,751.

Commissioner Woodlock expressed his concurrence while Commissioner Eastman noted a dissent.

Mr. Hulme in his statement said the company denies the commission's deduction of some $385,000,000 for theoretical depreciation, saying that in its report the commission states that the field notes made by the government parties showed that "only 0.308 of one per cent of these properties had at valuation date subnormal maintenance." They further stated, he said, that "the field notes show that the remainder of the properties of the Lines East had either normal or above normal maintenance." He also called attention to the statement in the commission's reports: "The estimates of cost of reproduction covered by this report are based upon the 1914 level of prices, while the present values of the common-carrier lands covered by the report are based upon the fair average of the normal market value of lands adjoining and adjacent to the rights of way, yards, and terminals of the carriers, as of valuation date. This discrepancy will be removed when we adjust to later dates, in accordance with the requirements of the valuation act, the final values herein reported."

In the headnotes of the report on the Pennsylvania Railroad the commission gave the following summary of points decided in the report:

The cost of clearing and grubbing wooded areas adjacent to a railroad right of way required by State law for minimizing fire risk should be included in an estimate of cost of reproduction, although the areas in question are not a part of the railroad's property.

In determining the cost of reproduction of tunnels, topographical conditions as of valuation date are controlling and the conditions existing under original construction are immaterial.

Donations made by private parties toward the construction of bridges erected to eliminate grade crossings differ from contributions by governmental authorities and should be dis-

regarded in estimating cost of reproduction where the structure is owned by the railroad.

The sources of railroad ties for maintenance purposes during the pricing period need not be used in estimating cost of reproduction where it is shown that ties are available from cheaper sources.

Principles approved in prior decisions with respect to estimating the cost of reproduction of tracklaying and surfacing reaffirmed. The methods customarily obtaining in the construction of new railroads should be followed. Neither the cost of artificial seasoning and solidification nor maintenance expenses after the commencement of revenue operations is part of cost of reproduction new.

Synchronous condensers installed on railroad property by a power company in connection with supplying electrical energy for the operation of trains held to be property used by the power company, not by the railroad.

The cost of reproduction of carrier-built locomotives should be based on the market price of similar equipment during the pricing period rather than the cost of building such locomotives in railroad shops, where such cost does not include all proper overhead items.

Trainmen's equipment not attached to individual cars is expendable property, included in working capital, and should be excluded from cost of reproduction.

Athletic fields used exclusively by railroad employees are property devoted to common-carrier purposes.

Where a railroad owning a right of way in fee conveys to a city an easement for street purposes, at the same time reserving and excepting the right in perpetuity to operate its line on elevated structures, it owns an interest in land rather than a right in public domain.

A capitalization of ground rents can not properly be included in the investment in road and equipment account.

Expenditures for property charged in the past to accounts other than investment in road and equipment may not be charged to the latter account without strict proof that such property was in existence on valuation date and that retirements have been accounted for correctly.

Arguments in Western Grain Rate Case

WASHINGTON, D. C.

THREE weeks of oral argument before the full membership of the Interstate Commerce Commission and a committee of state commissioners in the commission's general investigation of rates on grain and grain products in the western district and for export, Part 7 of the rate structure investigation under the Hoch-Smith resolution and related cases, was brought to a close on June 15. As there was one day in each week in which the commission did not sit this made a total of fifteen days of argument and the transcript taken was estimated at about 3,000 pages. Separate arguments were presented by approximately 90 persons, including fifteen state commissioners or representatives of state governments, about a dozen representatives of the railroads, and others representing grain exchanges and various commercial organizations. Some of them presented separate arguments of various phases of the record.

The argument was based on a proposed report by Examiners Hall and Mackley, recommending a mileage scale of rates for the territory east of the Rocky mountains and a somewhat higher one for Mountain-Pacific territory. Tentatively they suggested for the basic scale 90 per cent of the scale prescribed by the commission in Docket No. 12,244. The proposed report was 159 pages and was based on a record of some 53,000 pages, together with 10,000 pages from other records incorporated, 2,100 exhibits and some 15,000 pages of briefs.

Before the close Chairman Lewis announced that the commission would not be able to hear oral rebuttal arguments in the three weeks available but that it would permit the filing of rebuttal memoranda by parties of record within 15 days from June 15. Copies of the rebuttal memoranda are also to be sent to the state commissioners.

As some 30 formal complaint and suspension cases had been consolidated with the general investigation proceeding for hearing, the proposed report and the arguments involved a wide variety of issues and the commissioners in many cases had difficulty in obtaining responsive answers to specific questions as to what the various interests thought it ought to do with some of the main issues presented by the proposed report, particularly as to whether there should be a general mileage scale. Many were opposed to the idea of a uniform scale and many more desired no disturbance of present conditions, but the state commissioners generally protested that the proposed report would have the effect of increasing rates and protests were made also by representatives of interests whose rates undoubtedly would be increased by the recommendations of the report. Most of those who argued for the railroads expressed a general approval of the main features of the proposed report with some exceptions, although they urged the commission to exercise care in applying them so as not to reduce carrier revenues, and the southwestern lines asked for higher rates.

The general presentation on behalf of the western lines was begun on June 13 by A. B. Enoch, general attorney, Chicago, Rock Island & Pacific, who contended that the record showed that agriculture had recovered from the depression of 1920 and 1921 and that its condition should not be judged by a temporary depression in wheat prices. Commissioners Aitchison and Eastman asked if the commission could shut its eyes to the fact that Congress was sitting in special session at the call of the President to consider the agricultural problem. Mr. Enoch replied that there is a difference between "political depression" and that which existed in 1921. R. J. Hagman, assistant general counsel of the Great Northern, urged the commission to adopt the recommendations of the examiners that rates be made in accordance with the 12,244 scale, rates east of the Missouri river to be 90 per cent of the scale and those west of the river 100 per cent of it. He cited the failure of the roads to earn 5¾ per cent and said that in no other section of the United States are earnings so low as in the northern states. Douglas Smith, of the Union Pacific, speaking for the Mountain-Pacific lines, defended the existing rates in that section, saying the commission has invariably allowed higher rates in that territory than in other parts of the West. George H. Muckly, for the Southern Pacific, discussed rates via the Pacific coast. P. F. Gault, commerce attorney of the Chicago & Northwestern, urged that in any revision made by the commission care should be taken not to reduce the revenues of the roads in Western Trunk Line territory. R. S. Outlaw, commerce attorney of the Atchison, Topeka & Santa Fe, speaking for the southwestern lines, devoted his argument to their exception to the proposed report on the ground that it ignores the necessity of the southwestern lines for a higher rate level. He said that, service considered, rates in the Southwest are lower than in any other part of the western district. Arguments also were presented by Ernest Ballard, on behalf of the Railroad Security Holders' Committee for a Fair Return; Walter McFarland, Chicago, Burlington & Quincy; J. N. Davis, commerce counsel, Chicago, Milwaukee, St. Paul & Pacific; E. A. Smith, Illinois Central; and H. H. Larimore, general attorney, Missouri Pacific.

The Western Pacific Looks Ahead

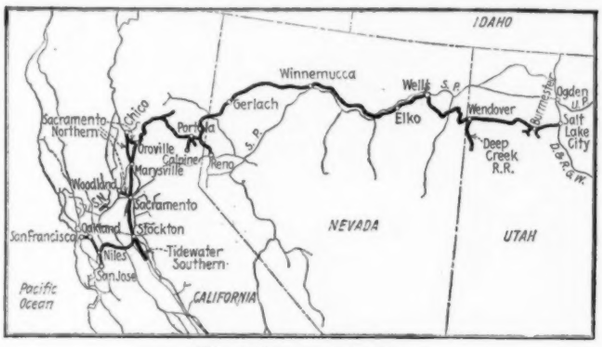
Program of improvements to reduce operating expenses, combined with continuous traffic growth since 1921, point to higher earnings

EACH year since 1921 has witnessed a steady increase in freight traffic and operating revenues of the Western Pacific. In 1928 revenue ton-miles totaled slightly more than 1.5 billion, which was the highest figure ever attained. It was 6.7 per cent greater than the total for the post-war peak year, 1919, and 83 per cent greater than that of 1921, which marked the low point from which has been built the steady increase in traffic which has characterized each subsequent year.

Operating revenues likewise increased steadily from $12,104,155 in 1921 to $17,594,075 last year—an improvement of 45.4 per cent. The operating ratio fell from 85.85 in 1921 to 70.22 in 1926. Thereafter, following the inauguration of the road's rehabilitation program (see *Railway Age* of June 22, page 1416) with the tendency of such improvements to interfere with normal operations, the operating ratio has increased—to 79.87 per cent in 1927 and 80.75 in 1928. The completion of this program, however, should bring about an immediate and sharp decline in this ratio—particularly if traffic continues to increase at the steady pace which it has maintained since the end of federal control.

The railroad at the end of 1927 had outstanding $47,500,000 of common and $27,500,000 of preferred stock, all of which is owned by the Western Pacific Railroad Corporation. Compared with this total stock capitalization of $75,000,000, long term debt totaled only $39,019,300 and total capital liabilities—stock and bonds—$122,545,946. The railroad in 1928 earned $563,278 over fixed and sinking fund charges. While this did not represent a large margin of safety, it will be remembered that the road is now operating under abnormal conditions, which should disappear as the improvement program nears completion. As stated above, the operating ratio in 1928 was 80.75. If the improvement program should result in reducing this ratio to 70—a conservative figure since it was attained in 1926 before the program of betterments was undertaken—then, on the 1928 earnings basis, operating expenses would be almost $2,000,000 less than they actually were last year. Net income of but $4,500,000 would be required to equal 6 per cent on the present volume of outstanding stock (which may be compared with actual net income of $613,278 in 1928, reflecting present abnormal operating conditions).

In addition to the program of improvement, which is calculated to bring about a reduction in operating expenses, the company is making a vigorous effort to improve its position from a traffic standpoint. The traffic agreement with the Southern Pacific, incidental to the agreement for operation of parallel lines of the two companies in Nevada as joint double track, was outlined in the *Railway Age* of February 14, 1925, page 407. Other plans for the purpose of increasing traffic include the proposed construction of extensions in



The Western Pacific

California, provided approval is secured from the Interstate Commerce Commission. Among these proposed extensions is one northward to meet a southward extension of the Great Northern from Klamath Falls, Ore. During 1928 a short connecting line was constructed with the Oregon Short Line at Wells, Nev., giving the Western Pacific access to Union Pacific territory in Idaho and Montana, greatly shortening the distance to that territory via its line and bringing an increase in traffic. Another construction project which should be of material aid to the Western Pacific is the Dotsero cut-off in Colorado, which should greatly strengthen its eastern connection, the Denver & Rio Grande Western, from a traffic standpoint by making the Moffett tunnel route available to it and permitting reductions in schedules.

Table II shows the percentage of various classes of commodities to total tonnage. The high degree of diversification in tonnage will be noted, as will also the steady increase in the relative importance of manufactures and the declining ratio of mine and forest products to total tonnage. This indicates the growing importance of high grade freight traffic to the road. This, combined with the fact that the company originates less than half of its total tonnage, is indicative of the kind of service the road must give to show a steady increase, as it does, in the volume of its freight business. The average haul and receipts per ton-mile for

Table I—Western Pacific—Freight Traffic, Revenues and Expenses

	Revenue Tons	Revenue Ton Miles (Thousands)	Average Haul (Miles)	Aver. Receipts Per Ton Mile (Cents)	Operating Revenue	Operating Expenses	Operating Ratio	Net Railway Operating Income
1920	2,699,572	1,360,561	504	.88	$13,595,789	$10,311,410	78.48	$2,416,212
1921	1,706,346	819,658	480	1.09	12,104,155	10,391,343	85.85	2,858,533
1922	2,120,297	910,306	429	1.04	12,505,348	9,837,151	78.66	1,105,345
1923	2,875,108	1,044,820	363	1.01	14,138,269	10,663,712	75.42	1,819,796
1924	3,078,522	1,151,930	374	.95	14,370,467	11,477,665	79.87	1,329,265
1925	3,521,490	1,293,678	367	.95	15,569,045	11,332,942	72.79	2,451,067
1926	3,709,599	1,338,279	361	.97	16,057,065	11,275,140	70.22	2,470,264
1927	3,890,707	1,385,566	354	.97	16,433,463	13,125,069	79.87	349,851
1928	3,997,058	1,501,222	376	.98	17,594,075	14,206,209	80.75	613,278

each year since 1920 are shown in Table I. The importance of the road as a bridge line is reflected in the length of the average haul—376 miles in 1928—as it is in the proportion of tonnage received from connections.

Statistics reflecting freight service operating efficiency

Table II—Percentage of Various Classes of Commodities to Total Revenue Tonnage

	1923	1924	1925	1926	1927	1928
Agricultural Products....	13.80	13.79	13.69	13.93	13.30	14.83
Animals and Products...	2.23	2.40	2.21	1.96	1.98	2.11
Products of Mines.....	44.46	40.04	34.93	31.21	34.88	32.29
Products of Forests.....	18.06	19.77	24.15	26.76	23.68	18.48
Manufactures & Misc....	19.44	22.06	23.16	24.24	24.26	30.42
L. C. L.....	2.01	1.94	1.86	1.90	1.90	1.87
Per Cent Originated....	47.4	44.7	46.0	46.7	45.4	43.0

in 1928 are given in Table III. Comparison with preceding years is omitted for the reason that, under present abnormal conditions, such comparison would not accurately reflect tendencies. The high average mileage per car per day and of net ton-miles per car-day will be noted, as will also the favorable total of gross ton-

Table III—Selected Freight Operating Statistics

	1928		1928
Mileage operated.....	1,050	Freight cars per train..	50.2
Gross ton-miles (thousands)	4,185,956	Gross tons per train....	1,940
Net ton-miles (thousands)	1,676,397	Net tons per train.....	777
Freight train-miles (thousands)	2,158	Train speed, miles per train-hour	15.2
Freight locomotive-miles (thousands)	2,800	Gross ton-miles per train-hour	29,468
Freight car-miles (thousands)	106,132	Net ton-miles per train-hour	11,801
Freight train-hours	142,053	Lb. coal per 1,000 gross ton-miles	109
Car-miles per day.....	44.7	Loco. miles per loco.-day	75.4
Net tons per loaded car..	23.5	Per cent freight locos. unserviceable	19.7
Per cent loaded to total car-miles	67.3	Per cent freight cars unserviceable	8.9
Net ton-miles per car-day	706		

miles per train-hour, the comparatively high fuel efficiency and the index of locomotive utilization.

The following tabulation shows the ratio which the principal factors in operating expenses bear to total operating revenues:

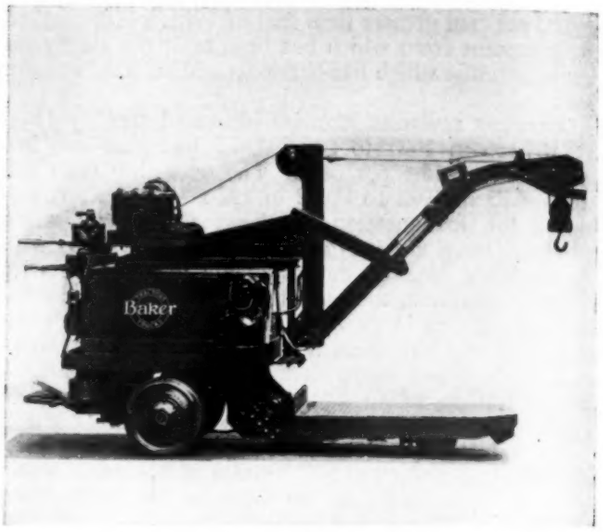
	M. of W. Ratio to Oper. Rev. (%)	M. of W. Expenditures per Equated track mile	M. of E. Ratio to Oper. Rev. (%)	Trans. Ratio to Oper. Rev. (%)
1921	17.8	$1875	19.3	37.9
1922	15.8	1705	17.6	36.5
1923	16.2	1963	16.2	33.6
1924	19.2	2351	17.5	33.9
1925	14.4	1892	15.8	33.7
1926	14.2	1911	15.7	31.7
1927	18.8	2581	17.9	32.8
1928	19.0	....	17.1	34.3

It will be seen that the maintenance of equipment ratio is satisfactorily low, as is the transportation ratio. The bringing of roadway and structures up to a high standard should result in some reduction in the latter ratio. It is in the maintenance of way ratio, however, where the major reduction is to be expected. It will be seen that, even before the inauguration of the improvement program, this ratio was rather high. The completion of the program ought not only to end that part of replacement expenditures which are chargeable to operating expenses, but should also make for more economical maintenance in the future. Using 1928 as a criterion: If the maintenance of way ratio had been 13 per cent instead of 19 per cent, as it actually was—operating expenses would have been reduced by more than one million dollars, equivalent to 1-1/3 per cent on outstanding stock, common and preferred. Such potential savings, combined with a steady growth in traffic which has continued since 1921, are indicative of what may, barring unforeseen developments, be expected in the way of improved net earnings in the years which lie immediately ahead.

Baker Elevating Truck with a Swivel Crane

THE Baker-Raulang Company, Cleveland, Ohio, has placed on the market a three-ton elevating truck with a swivel hoist which is adapted to handling boxes, crates, machine parts, air compressors and heavy castings. Its 26-in. by 55-in. platform is available for direct loading or for handling skids. The frame is fabricated entirely from structural steel and follows the Baker "straight line" design, which eliminates eccentric strains.

The 1,500-lb. crane boom swivels 180 deg. It is mounted on ball bearings and can be readily swung by



Baker Three-Ton Elevating Truck with a 1,500-Lb. Swivel Crane

hand. A hoist unit, operated by a control switch on the dash, raises or lowers either the boom or the hook. This unit is driven from the truck battery. A limit switch opens the circuit when the hook reaches its maximum top position. A push button conveniently located on the boom provides power for raising or lowering the boom which can be locked in any one of five positions. This change can be made with the load on the hook if necessary.

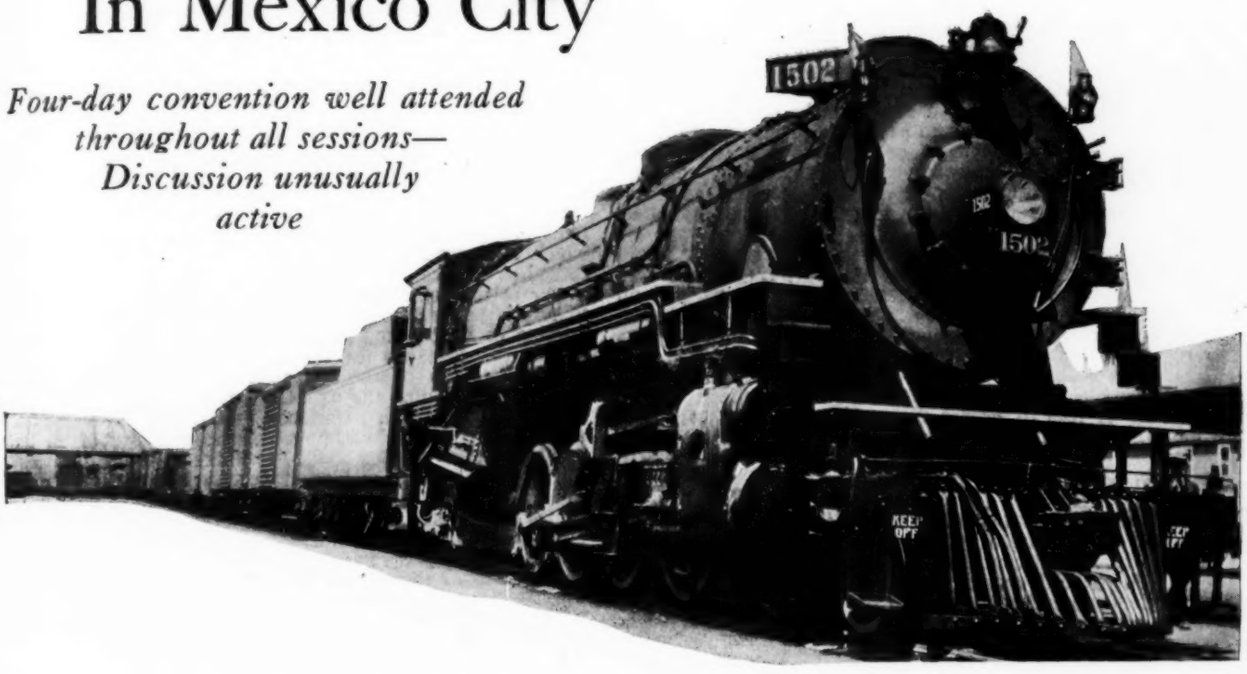
The combination of crane, lift truck, load-carrying truck or tractor for handling trailers is provided with large battery capacity and meets the demand for a general-purpose truck and crane. A wide tread trailing axle insures stability when lifting maximum capacity loads over the side of the truck.

* * *

Boston & Albany Station at Huntington, Mass.

Superintendents Conclude Meeting In Mexico City

Four-day convention well attended throughout all sessions—Discussion unusually active



THE thirty-sixth annual meeting of the American Association of Railroad Superintendents came to a conclusion on Friday, June 7, with the election of J. J. Franco, general superintendent of transportation, National Railways of Mexico, Mexico, D. F., as president; C. E. Brower, general superintendent of transportation, A. B. & C., Atlanta, Ga., as first vice-president; F. O. Whiteman, superintendent, East St. Louis & Suburban, East St. Louis, Ill., as second vice-president; C. Forrester, superintendent, Canadian National, London, Ont., as third vice-president; Victor Parvin, general manager, Ann Arbor, Owosso, Mich., as fourth vice-president, and J. Rothschild, St. Louis, Mo., as secretary-treasurer. Minneapolis, Minn., was selected as the location for the next convention. A final message of felicitation was delivered by Luis Montes de Oca, president of the board of directors of the National Railways of Mexico, after which the convention adjourned.

In addition to the reports and papers presented in the *Railway Age* of June 15, the following completed the program.

Pullman Safety

In an address entitled "Why Pullman Travel is Safe," Harry Guilbert, director of safety, Pullman Company, emphasized the low casualty rate among travellers in Pullman cars. He also referred at some length to the unusually low accident record among employees in the Pullman shops, stating that there has not been a loss of an eye in these shops in five years. He also reported that six of the larger repair shops, with 7000 employees, worked the entire month of April without an injury causing loss of time and that 19 of the 32 shops had no reportable accidents during the first quarter of 1929.

In an informal discussion of means of securing heavier loading of cars, A. P. Stevens, district manager, Car Service Division, American Railway Association, Detroit, Mich., described the manner in which improvement has been effected in numerous instances and stressed the importance of the superintendent, as the man in the field, taking an active interest in this movement.

W. H. Haley, assistant general superintendent of transportation, M. P., stressed the value of personal contact with shippers. He stated that he had personally covered more than half the Missouri Pacific lines on a motor car with the superintendents and train masters, calling on shippers and has secured remarkable results thereby. His road also prepares a monthly statement for distribution among all interested parties, comparing the current loading of all commodities with those of the preceding month and the corresponding month of the preceding year, thereby stimulating a desire for improvement.

J. M. Hood, general superintendent, A. C. & Y., described the method developed on his road in loading salt whereby shippers now load two consignments for different destinations in opposite ends of the same car, each frequently exceeding 30,000 lb., the car then carrying two waybills. L. G. Waldrop, superintendent Nashville, Tenn., terminals L. & N.-N. C. & St. L., reported that more than 400 cars were saved in the loading of fertilizer in his territory last spring by a similar expedient.

Crossing Protection

That the division superintendents as a group are keenly alive to the seriousness of the grade crossing accident problem and are deeply interested in the development of methods for the reduction of accidents at these points is demonstrated by a report presented by a committee, of which J. E. Laporte, superintendent, Cana-

dian National, was chairman. The committee arrived at the following conclusions:

Despite the fact that our railways have spent huge sums of money, both for crossing protection and for the education of motorists, highway crossings are dangerous places, and accidents continue to occur mostly through the sheer negligence of drivers of automobiles. Legislation by the state to compel each vehicle to come to a full stop or to slow down to a speed of eight miles per hour before proceeding over a railway track at grade is a move towards the reduction of accidents, and it is suggested that a resolution be made to have this law adopted universally in the United States, Canada and Mexico. It is also recommended that a resolution be adopted whereby our legislatures be petitioned to pass laws requiring all drivers of automobiles to pass vision, color, sense and hearing examinations, similar to those for train employees, and that operators of motor coaches and trucks be subject to the Interstate Commerce Commission regulations regarding hours of service.

Like so many laws on the statutes, this particular law would lose its good purpose and become dormant if its enactment were not enforced. In our larger cities and towns, and on the highways, motor and vehicular, as well as pedestrian traffic, has been controlled by the strict enforcement of the laws or regulations enacted to regulate such traffic, and traffic over highway crossings can also be controlled by such measures. No warning sign or signal can be made as effective as a court fine or loss of license for carelessness on the part of a motorist at highway crossings.

Present Method of Circularizing Public Ineffective

The present method of circularizing the public by hand or mail, and the posting of warnings, is ineffective, because the motorist in general considers such as propaganda, and, therefore fails to read or study such literature. Therefore, our railways should endeavor to reach the public through personal contact with schools, theatres, or other gatherings and with the best forces available.

Crossing bells have lost considerable effectiveness because of the increasing use of closed cars. Crossing gates are expensive and not effective; the wigwag signal is often disregarded, and the crossing watchman is not always successful in avoiding accidents where he must police more than one track. Therefore, your committee recommends the adoption of a color light type signal, lighting on approach, and that two lights be provided which will flash alternately to further impress on the motorist the fact that a train is approaching. It is further recommended that, where possible, this signal be installed in the center of the highway and at least 12 ft. from the nearest track. The track circuit should be sufficient to provide a 30-sec. warning of approaching trains.

Discussion

Many members took exception to the recommendations of the committee. J. L. Close, division superintendent, G. N., and others reported that the recommendation of the committee favoring a crossing stop law was ineffective in most of those states where it had been passed. Others criticised the recommendation for the universal installation of a colorlight signal as not applicable in many places, while still others criticised the location of this signal in the center of the road. As a result, the report was referred back to the committee for further study, with instructions to confer with other organizations considering the same subject.

In the discussion of methods of reducing crossing accidents, L. G. Waldrop, superintendent, Nashville, terminals, L. & N.-N. C. & St. L., described a dramatic organization created among employees of one division of the L. & N. which put on a play with a safety lesson at numerous theatres along that division. Members of this cast also broadcast safety messages at regular intervals. H. C. Rochester, assistant to vice-president, Canadian National, reported that when a crossing gate is run through and the identity of the offender is ascertained, a bill for the damages is presented to him by the legal department and collection made by recourse to the courts if necessary.

Measures of Operating Performance

There has been a feeling in some quarters that the Gross Ton-Miles per Traction Pound-Hour is a more accurate measure of railroad operating performance than the unit, Gross Ton-Miles per Train-Hour. For this reason, a committee was appointed to consider the relative merits of the two units. This committee, of which J. H. Owens, general superintendent of transportation, Florida East Coast, was chairman, reported as follows:

The present plan of measuring efficiency by the factor of gross ton-miles per train-hour is preferable to that of gross ton-miles per traction pound-hour, a factor which has been proposed as a substitute. Gross ton-miles per train-hour reflect the tonnage handled and operating costs, while gross ton-miles per traction pound-hour show only the extent to which the capacity of the locomotive is used. While your committee realizes the importance of utilizing the capacity of power to the fullest extent possible, it is also of the opinion that it is neither feasible nor economical, on account of the varying conditions and character of traffic, together with the present day demands for fast service, to attain the maximum hauling capacity of the locomotives. The railroads of this country have, within the past few years, by improved facilities and improved operating efficiency, established fast and dependable service, thereby enabling business interests of all kinds to reduce their surplus stocks, resulting in a great saving in invested capital, but making it necessary to move all classes of freight with dispatch. Therefore, time and not tonnage becomes the governing factor, not only to meet trade conditions, but for the quick turn of the power, which increases gross ton-miles per train-hour, and, in the final analysis, permits of the greater use of the power, although the full utilization of its capacity cannot, for reasons stated, always be accomplished.

There are four other specific reasons why the committee wishes to submit against changing the present method—namely:

First: That the present method was adopted by the Interstate Commerce Commission after careful study.

Second: That to adopt the suggested plan would require changes in the present reports, and it is doubtful if we could secure the consent of the commission to the changes.

Third: That gross ton miles reflect unit costs of operation, which are essential, and the other plan does not.

Fourth: If the method is changed, as suggested, we would be without comparisons for the past several years, as well as for the first year of its adoption.

This report was received without discussion.

Eliminating Waste

A committee, of which Victor Parvin, general manager, Ann Arbor, was chairman, submitted the following report on the elimination of waste.

There is hardly any doubt but that employees would be more careful in the use of the company's goods if they were informed as to the actual cost of the materials and supplies they were using, which would at the same time, teach them that they have the same responsibility in avoiding the waste of an article furnished by the railroad as they would if it was their own property.

Means should be found so that employees using materials and supplies, and especially those responsible for the proper use of them, could be held personally responsible. Results cannot be obtained along any line where personal responsibility is not placed.

The company must recognize its responsibility and should see that proper tools and equipment are furnished. It certainly is a waste to furnish improper tools or improper equipment such as obsolete machinery to be used in shops and by bridge and track forces. It cannot be expected that employees will take any great amount of interest in avoiding waste, when the company follows out the policy of furnishing improper tools and improper equipment.

Properly applied criticism and fair and just discipline will have a far-reaching effect upon all employees with relation to their use of materials and supplies. Criticism is absolutely necessary, but it should be constructive and where there is criticism, there should also be commendation wherever and whenever it is justified. Discipline justly applied has no tendency to create a feeling of ill-will on the part of the employees and

the employees recognize and accept discipline graciously, when they know that the supervising officer is absolutely fair in making his decisions.

Too much care cannot be exercised in the choice of supervising officers and foremen. Unless these men practice conversation of materials and supplies, and in addition teach those under their jurisdiction, waste will result. In order to avoid waste there must also be a constructive policy on the part of the purchasing and stores department in the ordering and distribution of materials and supplies.

A great deal of waste can be avoided through the proper organization of a re-claim department. When an employee realizes that the company is re-claiming and re-using materials by re-building and restoring them to good condition, he becomes interested, whereas if the material is burned, scrapped or thrown away, the employee assumes the same attitude as that of the officers.

Some railroads have found, by actual experience, that where they assist their employees in becoming financially interested in the company, this in itself immediately puts those employees in the frame of mind to save and they become receptive to any suggestions that may be offered, that might avoid waste on the part of the railroad of which they are part owners.

Discussion

In the discussion of this report, R. M. Campos, assistant to freight traffic manager, National Railways of Mexico, emphasized the fact that persuasion works slowly and that other measures must be developed to stimulate employee co-operation. He advocated the establishment of a means of determining the cost of various operations and of disseminating these figures among employees, with comparisons with other corresponding periods. He also advocated the publication of an honor roll of employees of especially meritorious records and of the distribution among these employees of a portion of the savings effected through their efforts.

Operating Trains by Signal Indication

As its report on the above subject, a committee, of which H. F. Milligan, superintendent, Cleveland, Cincinnati, Chicago & St. Louis, was chairman, presented three papers, showing the results obtained by the operation of trains by signal indication on the Cleveland, Cincinnati, Chicago & St. Louis, the Pere Marquette and the Southern Pacific.

C. F. Stoltz, signal engineer, C. C. C. & St. L., described the results secured from the installation of automatic block signals between Berea, Ohio, and Galion, 67.2 miles, in 1922, which showed a return of about 55 per cent on the investment, and also between Cincinnati, Ohio and Greensburg, Ind., 58.3 miles, which showed a return of 24 per cent on the investment. As this information was published in the *Railway Age* of June 2, 1928, it is not repeated here. G. W. Trout, signal engineer and superintendent of telegraph, Pere Marquette, described that road's dispatcher control signal system between Saginaw, Mich., and Flint, 20 miles, which was placed in operation on June 30, 1928, and which was likewise described in the *Railway Age* of October 6, 1928. A third paper was presented by P. Slater, special representative, Southern Pacific, describing the installation of remote control switches on this road's line across the Tehachapi mountains between Kern Junction and Mojave, 68 miles. This installation, which resulted in an increase of 19 per cent in gross tons per train and 40 per cent in gross ton miles per train hour, was described in the *Railway Age* of January 12, 1929.

This report was accepted without discussion.

Daily Operating Statistics

F. M. Brown, superintendent, Pittsburgh & Lake Erie, presented a paper on the most advisable and accurate form to be used to enable superintendents to obtain daily statistical data on the gross revenues and expenditures of their division, as follows:

Because of the fact that the figures representing the daily revenues are only approximate, only payroll figures of representative classes of employees should be used as the expense item and with that in mind, two forms are submitted:

This report contemplates, as a basis, the use of freight train mileage multiplied by the freight revenue per train-mile to indicate the daily revenue. The figure "freight revenue per train mile" is obtained from the accounting department's monthly report—"freight and passenger statistics" and it is suggested that the figure to be used is the average revenue per train-mile of the last available monthly figure furnished by the auditor, changing this figure with each succeeding monthly report. The daily train mileage figures are readily obtainable from the operating reports covering the movement of trains each 24 hours.

The payroll expenses of engine service employees in road service are readily obtainable from daily operating reports showing the number of trains over the division, and the payroll expenses of engine and train crews in yard service are obtained from the reports forwarded to the superintendent daily by general yard masters, together with any overtime which may be made by any or all crews. Payroll expenses of station and yard clerical forces, generally, do not fluctuate greatly and these expenses per day are readily obtainable.

The consideration of passenger revenue and payroll expenses in connection with handling passenger trains has been eliminated for the reason that this service is not subject to the same fluctuations as freight service. Further, no consideration is given to fuel and train supplies which fluctuate according to the number of trains or crews operated, as it is convincing that the expenses shown on Forms A and B are a real bar-

Form A

A. B. C. Railroad Company
Daily Report of Estimated Revenue and Expense
X. Y. Z. Division

..... 19....

Train Miles	Revenue per Mile	Total Revenue	Pay Roll Expenses						Ratio of Expense to Revenue
			Road		Yard		Station and Yard* Clerical Forces, Telegraph Forces, and Supervision	Total	
			Cond. and Trainmen	Engrs. and Firemen	Cond., Trainmen and Switch-tenders	Engr., Firemen and Hostlers			
Same Day Last Week									

* Includes Field Supervision, Train Masters, Yard Masters, Road Foremen of Engines, Etc.

Form B

A. B. C. Railroad Company
Summary of Daily Estimated Revenue and Expense
X. Y. Z. Division

Month of..... 19....

Date	Train Miles	Revenue per Train Mile	Total Revenue	Pay Roll Expenses						Ratio of Expense to Revenue
				Road		Yard		Station and Yard* Clerical Forces, Telegraph Forces, and Supervision	Total	
				Cond. and Trainmen	Engrs. and Firemen	Cond., Trainmen and Switch-tenders	Engr., Firemen and Hostlers			
1 2 3 4 5 to 31 inc.										
Total										
Same Month Last Year										

* Includes Field Supervision, Train Masters, Yard Masters, Road Foremen of Engines, Etc.

ometer showing the relation between the expenses and the revenue.

The last column on these forms—"ratio of expenses to revenue"—is obtained by dividing the expenses by the revenue; it is, in other words, a percentage figure of expenses and reflects the efficiency of operation.

If all expenses were comprehended in a report of this nature, it will be readily seen that a large part of the expenses must necessarily be estimated, and for that reason it is believed that the purpose will be fully met by the representative expenses indicated on these reports. The daily revenues necessarily are, from month to month, an estimate, even though the figure used was the actual figure for the month reported by the accounting department, but nevertheless this report can be used as a barometer, as it will closely approximate the operating situation on any division or divisions.

To obtain the daily revenue, under certain operation conditions, it may be advisable to obtain a figure of "Revenue per loaded car" to use as a basis, instead of using train-miles and "Revenue per train-mile" if operating conditions seem to warrant using the "per car" method, which would change the column "Train-Miles" to "No. Loaded Cars" and the column "Revenue per train-mile" to "Revenue per loaded car." However, experience shows that the revenue per train-mile does not fluctuate to any great extent and it is recommended that the train-mileage and average revenue per train-mile be used to compute the daily revenue.

Another feature in connection with this report is the fact that it can be compiled quickly and should be avilable for use of the superintendent within an hour from the time the basic figures are received.

For the information of the Mexican railway officers, Mr. Brown also presented a complete description of the manner in which tickets and cash fares are handled on railways in the United States, to secure accuracy and efficiency.

This report was accepted without discussion.

Public Relations

It is coming to be increasingly appreciated on many roads that the division superintendent and the members of his staff are key men in a railway public relations organization, because of the constant and intimate contact which they have with the shipping and traveling public and the many opportunities which are theirs to promote a friendly attitude towards the roads. The discussion of those public relations measures which normally come within the scope of the superintendents activities has been a feature of the conventions of this organization for several years. This year a committee, of which F. O. Coleman, superintendent, Minneapolis & St. Louis, was chairman, submitted a comprehensive report on public relations, a summary of which follows:

There are two fundamental methods of stimulating interest in your public: first, by the contribution of something of educational value, and second, by the presentation of entertaining features. The two may run hand in hand or one may predominate, according to the objectives which you may wish to attain in any given community. In order to determine which of these two basic ways of generating response will be used, it is necessary to do considerable analyzing, fact-finding and listening. If your field of endeavor is not properly analyzed your work may have a negative appeal and lose its sense of proportion. If your public relations work is allowed to run rampant and is permitted to give biased information, jam through haphazard ideas and take advantage of the public in many ways, you will be met with disapproval.

The committee inquired into the public relations work of about 40 railroads and is of the opinion that it has obtained a fair cross-section of public relations work. Its findings are as follows:

All of the railroads included in this survey have officers available for public speaking before civic and service organizations, chambers of commerce and similar bodies. These men, in most instances, are executives and heads of departments. One line has established a public speaking class open to any employee who may wish to improve himself in that art and who will be available for speaking engagements at the completion of his course. The class meets once each week and is under the guidance of an expert instructor. The student is brought up through the fundamentals of diction to the point where he writes and eventually gives his own speech.

All of the railroads report that the value of public speaking is excellent and that a vast amount of good will can be stimulated, accruing to the benefit of the transportation agencies. Some of the carriers do not see that any particular good is derived from speaking on a non-transportation subject, but it is an acknowledged fact that frequently more progress toward mutual understanding and good-will may be accomplished with your listeners by presenting some other pleasant entertaining or interesting educational subject rather than by habitually "grinding the axe."

A detailed report was also given by the committee as to the results obtained on individual railways by the use of stereopticons, motion pictures, educational exhibits and the radio in furthering public relations. The radio activities are growing rapidly. One railway reported that, as a result of a series of chain programs, over 25,000 letters were received.

The report continued with a detailed statement of the value received from newspaper publicity, and other public relations activities, stressing the good that can be done by land and agricultural agents.

Recommendations

The report closed with the following recommendations:

1. That a clear conception of the public relations problem should be formulated and given to every executive and employee.

2. That the personnel is the means through which to put ideas into action, therefore the right employee-patron contact (good service) should be encouraged.

3. That the appeal to the public should take as many different aspects as possible, such as using public speaking bureaus, illustrated talks, educational exhibits, the radio, public literature, customer news bulletins and employee house organs, civic cooperation and the many specialized activities of the employee organizations.

Car Retarder Operation

A special committee, of which F. G. Swafford, general superintendent, Indiana Harbor Belt, was chairman, presented a report on car retarder operation in terminal yards and its effect on terminal efficiency and expenses. A summary of this report follows:

Many important factors affect the economy of operation of both retarder and non-retarder yards. The most important, perhaps, is that a hump yard should be so designed as to avoid interference with hump engines by train and other engine movement. The receiving yards should be so situated if possible, that the leads and other tracks will be used only by inbound trains and the hump engine. To prevent interference at the crest of the hump, it has been found beneficial to have advance or train yard tracks, into which cars may be pulled from the lower end of the classification tracks and built into trains in the train yards. This plan makes it unnecessary to put the cabooses on trains in the classification tracks, which always causes some delay in a yard where the volume of traffic demands a constant stream of cars over the hump. Further, it minimizes delays to outbound trains, that result from setting bad order cars out of trains, making it necessary to block the leads while doing it. A feature that may at first be thought unimportant is the cutting off of cars. However, it will be found that if the cars are cut off on the right side, the knuckle on the head end of the cars will be opened. While when cars are cut off from the left side, the knuckle on the trailing coupler will be opened. When they strike other cars in the classification tracks, the knuckle will, in many instances, close and the cars that follow will not couple on, whereas if the knuckle on the leading end of the cars is open there will be a great deal less work in coupling up tracks. This plan also operates to reduce the number of broken drawbars and knuckles, especially during cold weather.

There are many flat yards which are operated in several units, classifying cars for movement in two or more directions that can be converted into manually-operated hump yards with resulting economy and increased efficiency in operation. A single hump yard may be so designed and operated with car riders as to handle traffic satisfactorily for movement in two or more directions, where the number of cars per day to be classified does not exceed 2,400 and the average ratio of separation is 1 to 1½ cars per cut. In a retarder-equipped yard, as above described, 3,200 cars may be so handled.

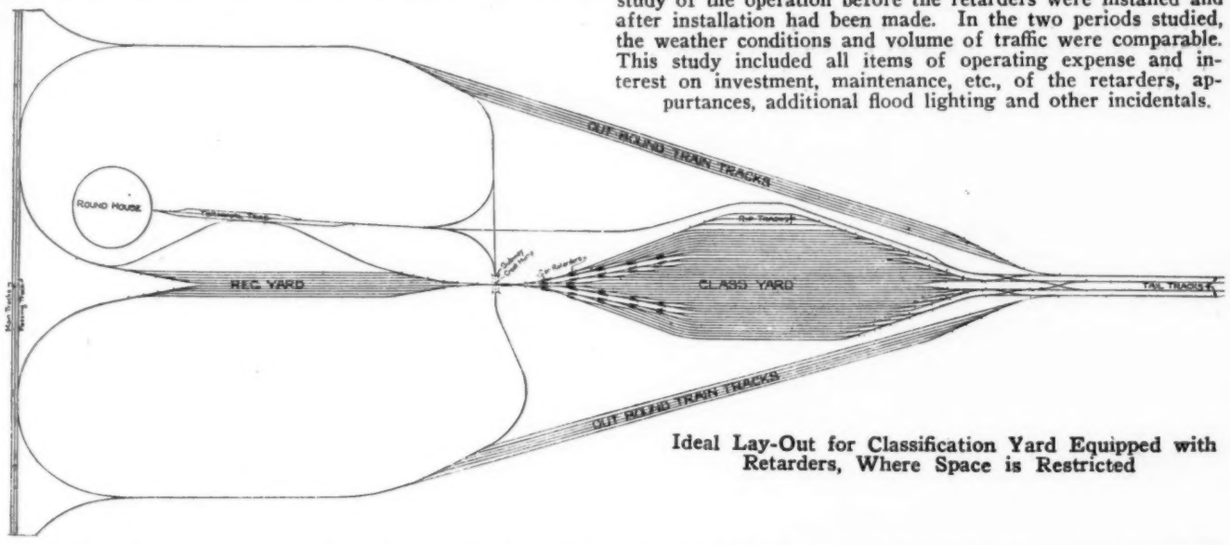
Through the operation of a yard of this kind, the problem of handling mixed traffic is solved and the necessity of rehandling cars from one yard to another is eliminated. Hump yards to meet these requirements may be adapted to the property available. The committee recommends that, where the property is available for such facilities, single hump yards be situated at right angles to the main track. In this way train yard tracks, for traffic in each direction, may be built parallel to the classification yards—one train yard on each side would be advisable. The outbound tracks leading from one of the train yards can be curved in the right direction to allow room for an enginehouse and shop facilities adjacent to the receiving yard. With this layout the least interference to the movement of engines and trains may be had. A plan showing the recommended yard is reproduced herewith.

Where property is not available for a layout of this kind, the single hump yard can be built with a receiving yard on the hump incline for trains from one direction and a flat receiving yard parallel to it for inbound trains from the opposite direction. This, of course, necessitates pulling cars back to shove over the hump. With this plan an outbound train yard can be built parallel with or in advance of the classification yard in which to make up trains for both directions.

Where the number of cars to be handled is too great for a single hump, and the traffic is heavy in both directions, the two-direction hump is probably better.

Economies of Yard Operation

The direct savings from car retarder-equipped yards in the cost per car classified are interesting. A careful study of one yard during a month when comparable conditions obtained, indicated a saving per car of $0.316. The comparison of costs, by which this result was determined, included a comprehensive study of the operation before the retarders were installed and after installation had been made. In the two periods studied, the weather conditions and volume of traffic were comparable. This study included all items of operating expense and interest on investment, maintenance, etc., of the retarders, appurtances, additional flood lighting and other incidentals.



Ideal Lay-Out for Classification Yard Equipped with Retarders, Where Space is Restricted

It is desirable, in the study of the economies effected by the use of the retarders, to direct attention to an article in *Railway Age* of November 3, 1928, on "Economics of Car Retarders." This study was based on the operation of the Hartford yard of the N. Y., N. H. & H., a hump yard that replaced smaller flat yards and was first operated manually and later with car retarders. Although the number of cars handled through this yard is comparatively small, the saving per car handled adequately justifies the car retarder installation. In this article it is plainly brought out that the larger the number of cars humped, the greater the saving per car will be, with retarder-operated yards.

We feel that it has been definitely established that the direct saving per car handled that is effected by use of the retarders, is sufficient to insure an adequate return on the investment and the greater the number of cars handled the larger the saving per car will be.

Economies of Train Operation

It is well recognized that terminal operation has a definite effect on train operation. Your committee has concluded that to reduce terminal train delay to a minimum an advance or train departure yard is advantageous. With a facility of this kind trains may be made up completely, the train lines charged and the train be put in readiness for departure at the time called. In taking trains out of classification yards, expensive delays result from throwing out bad order and reconsigned cars and doubling classifications together, using the lead tracks

and blocking engines of other outbound trains and yard crews.

The planning and operation of the terminal yard has also a marked effect on the extent of final terminal delay to road and transfer crews. Ready access to the receiving yards should be provided with a track arrangement insuring minimum interference from conflicting engine and train movements. Provision should be made for a receiving yard of a size adequate for peak periods of traffic. Rapid classification is also an essential element so that clear tracks will be available for all inbound trains on their arrival. In the rapid classification of inbound trains the use of the car retarder has proved an advantage.

To meet the constantly growing demands for through schedules, there is a necessity for means and methods that will bring about the quickest possible classification of inbound trains and the building up and dispatching of outbound trains. The car retarder is an important element in bringing about a solution of this problem. Experiment and experience have proved conclusively that cars can be switched with greater dispatch than is practicable with car riders.

As a part of its report, the committee included papers describing the operations of four yards. Chairman Swafford's paper covered the car retarder operations of the Indiana Harbor Belt at Blue Island, Ill., and Gibson, Ind., which were described in the *Railway Age* of February 26, 1927, and November 15, 1924, respectively. A. M. Umshler, superintendent of terminals, Illinois Central, presented a paper on Markham yard, Chicago, which was described in the *Railway Age* for April 17, 1926, and G. J. Shreeve, general superintendent, Belt Railway of Chicago, presented a paper on Clearing yard, described in the *Railway Age* of June 4, 1926.

Discussion

The discussion of this report was opened by a question regarding the difficulty experienced with car retarders in winter, to which Chairman Swafford replied that they gave less trouble than switch points. In reply to another question Mr. Swafford attributed little merit to the application of hot oil to journal boxes, stating that extensive tests last winter showed no difference in car resistance. As a result he has abandoned its use. J. M. Hood, general superintendent, A. C. & Y., on the other hand reported that the New England roads favored this practice.

Safety and the Supervisory Officer

In an address directed to the supervisory officer, Isaiah Hale, safety superintendent, A. T. & S. F. System, stressed the responsibility of this officer in inculcating safety methods in the minds of his men and in also stimulating them to make the most of their opportunities. He spoke at length, and a brief abstract of his address follows:

Under the common law it is the duty of employers to provide a reasonably safe place in which men are to work, to provide reasonably safe tools, and to provide reasonably safe fellow-workmen. Of far greater importance than any or all of these is the moral obligation of the employer to acquaint his men with the known hazards of their employment, which is not always done. Conversion of workmen to safe working habits is a long and arduous process at the best and one predestined to failure unless the directing officer is unafraid and unashamed to go before his men, at intervals, and earnestly and convincingly assure them of his wish to go hand in hand with them in working out their objective.

I am not alone in regarding supervision as the weakest link in the chain of industrial efficiency; efficiency and safety are inseparable. In addition to having supervision of the right sort from foremen in direct charge of men, one must have supervision of such supervisors by officers higher up. Too many supervisors think their principal, and only, function is to watch their men, to stand guard over them. One of the first duties of a supervisor should be to feel and show an interest in his men; in our organization, for years I have daily told our supervisors that one of their first and most important duties is to give their men a right view-point on their relationship with the Santa Fe.

I no longer talk safety to our men as I started to do 17 years ago, when I went about saying "Don't do that!" To the limit of my ability I am trying to boost the morale of our men, I am trying to increase their loyalty to their government, to themselves and to their job; I am trying to put into their minds and hearts an ambition to do something worthwhile and to be somebody. May I remind you that if *that* can be done, it will no longer be necessary for a foreman to watch or stand guard over men.

Foremen are seldom an eye-witness to an injury, but it is a far more important fact that they too often fail to see an injury in the making; they fail to see a workman doing things which their experience ought to tell them will, if repeated often enough, result in an injury, and in a kindly way then set the workman right rather than bawl him out after he has been hurt.

The one obstacle which more than another has impeded progress along safety lines is the disinclination on the part of so many men to give the subject careful enough thought and study to make up their own minds whether it is worthy of their support. The remedy lies in the influence of their supervisor.

One of the problems of every large organization is the man who knows a lot of things that are not so. My observation is that the thing a man is down on is generally the thing he is not up on, and that opens a wide and expansive field for such educational efforts on part of foremen as seem necessary to change the view-point.

Failing to get constructive help from his employer, a workman often turns to the ballyhooers who are ever ready to tell him of the wrongs being done him, of his "inalienable and God-given rights as a liberty loving American citizen," that "all men are born equal," and a lot of rot of that sort.

It is high time that railway managements begin to realize the different levels of intelligence in men, and be more discriminating in taking new men into their service.

Time was that when a man applied to many of us for work, we took his chest expansion and noted his back-muscle development and if it compared favorably with a third-rate prize fighter or wrestler, he was hired, even though he had little brain capacity. In a recent talk by a large employer of labor he said: "A considerable contribution to safety can be made by the exercise of sound judgment in not placing men in jobs for which they are not suited by reason of their age, physical condition or lack of training."

Ignorance is no excuse in the eyes of the law, yet it is the underlying excuse for a lot of industrial accidents and decreased efficiency. Workers remain industrially ignorant largely because of failure of supervisors properly to discharge their duty along the line of industrial education. Workers do not get hurt nor do they do indifferent work because they want to but generally because their foremen permit them to. The efficiency or safety record of any department is a mirrored reflection of the aptitude and willingness of its foremen to serve as teachers of men.

The foreman who is fair in both mind and practice, who is as free to commend his men as to criticize them; whose criticisms, when given, are given constructively instead of being destructive; who has a human appreciation of effort, faithfulness and loyalty, who earnestly tries to treat his men as he would have his boss treat him, is the foreman who is breeding happiness on the job.

A modern railroad is, or should be, a great educational institution; its professors are the executives; its teachers its foremen, and its pupils the workers; its courses are given on construction, maintenance and operation; its purpose is to serve while building permanently. The teachers of this vast army of men, most of whom really want to learn, will find there is no more important, interesting and satisfying work than that of teaching workmen that no measure of success is possible without intelligent and conscientious effort.

Motor Vehicles, Airplanes and Freight Containers

For several years, the Superintendents Association has been studying the effects of the newer forms of transportation on railway traffic. They have given particular attention to the competition of motor coaches and trucks and to the progress which the railways are making in adapting these facilities to their own operations. They have also studied the problem of the light traffic branch line and the possibility of using rail motor cars in passenger service here and also in local main line service. This year a committee, of which M. F.

Steinberger, manager of highway transportation, Baltimore, Ohio, was chairman, added to its investigation the study of airplane competition and the use of the container and consolidated cars for l.c.l.freight.

"Consolidations of the smaller motor coach operations," the committee reported, "continue with the result that larger and better managed lines are evolving therefrom. The country is criss-crossed with such lines and their number is increasing with the continued construction of roads."

It is clear that the use of automotive vehicles will continue to grow, and that the use of local passenger trains for passenger transportation is rapidly fading from the picture, except in such places as are not reached by the highways. It should always be borne in mind that, although we speak of the motor coach in connection with the decrease in passenger train earnings, it is the concensus of opinion that the private automobile contributes more to the loss of business than the coach. In 1927, there were 287,928 miles of good roads in the state highway systems, and 2,600,000 miles of country and local roads. A total of 575,000 miles were hard-surfaced, and the total highway expenditures in 1927 were $1,123,607,055, as compared with $187,524,193 in 1913. Can we wonder at the growth in the use of automotive equipment in the light of such figures?

It is a matter of such common knowledge to all railroad officers that the revenues of passenger trains in districts where good roads abound are sadly depleted, these depletions taking place in a ratio proportional to the increase in the available highway mileage, that this committee feels it unnecessary to quote any statistics showing the continued effect of highway automotive competition with the railroads.

Airplane Development

The committee called attention to the development of the airplane and to its growing appeal to the popular imagination of the public. Up to this time, the committee reported, its use in the United States has been largely confined to the carriage of mails and some express; and by private individuals, largely for sport and in a few instances for business reasons.

However, there is a growing realization on the part of the public that airplane service in the hands of a well organized responsible company is safe and dependable, and, when considerations of time saved are given, not expensive.

The manufacture of planes increases rapidly; a number of commercial lines are in existence; several railroads have traffic arrangements for joint rail and air services, others project entrance into the field; improvements in plane construction increase their safety, prices decrease, publicity continues wide and is making our people air-minded; the commercial advantages of quick air communication with our southern neighbors, the Mexican republic, and other nations in Central and South America are being recognized; and all these point infallibly to the fact that within a short time the air lines will be as well served as the highways and railways.

This will undoubtedly lead to some further reduction in railway passenger revenues, and it brings us to the inevitable conclusion that the railroads should take an active part in this development, rather than delay as they did in the development of motor coach and truck transportation.

The Light Traffic Branch Line

In the consideration of the problem of the local passenger train, and particularly of the light traffic branch line, the committee stated that no rule can be laid down for general application to indicate the proper measure which should be taken as to abandonment of service, replacement by rail motor car, mixed train service, or motor coach, for each situation must be studied on its own merits.

In one place a highway coach might do the work, but the road does not parallel the railway. Then, whether or not any other service is economically justified, a rail car will have to be used, assuming service cannot be discontinued.

It is an almost unanimously accepted view that rail cars do not increase business, but do effect economies. It is also the opinion of some roads that an improved rail service, providing certain luxury not generally given in day coach trains, is efficacious in competing with highway transport. Some roads are trying the experiment of high-class coach trains, with individual seat coaches, observation cars, dining cars, etc., and report encouraging results. This, however, can only apply to trains serving comparatively large centers of population.

Freight Containers

The committee was asked to report this year for the first time on freight containers, but in view of the fact that the Interstate Commerce Commission is now conducting an investigation on its own motion into all phases of the question of containers and consolidated cars, the committee did not feel it to be advisable to make any recommendations on the subject at this time.

It, therefore, confined its report this year to quoting from a report on the same subject made to the American Railway Engineering Association by its committee on "Economics of Railway Operation."

In its inception, it was thought that the major use to be found for containers would be in the movement of L. C. L. freight from door of consignor to door of consignee, trucks being used at either end and the railroad as the transportation medium between cities. It has since developed that the volume of freight susceptible of such handling is so small that it is only through the use of containers by some freight-consolidation medium that a real use can be found for them.

Advantages and Disadvantages Claimed

Among the advantages claimed for containers are:

1. Reduction in freight station expenses
2. Reduction in general office expenses
3. Reduction in loss and damage claims
4. Reduction in switching costs
5. Elimination of thefts
6. Ability to handle increased business with no increase in station facilities
7. Reduction in car repairs
8. Increased utilization of equipment
9. Reduction in expense of train operation
10. Increased car load
11. Reduced crating expense to shippers
12. Quicker service

Among the claimed disadvantages are:

1. Necessity for use of special equipment, cranes, etc.
2. Cross-haul of empty cars
3. Inability to handle at shippers' warehouses on account of lack of cranes
4. Possibility of disturbing existing rate structure
5. Car and container accounting
6. Charge for use of containers
7. Loss of freight revenue due to reduction in use of crates
8. Duplication of less than car load service, because all freight cannot move in containers
9. Possibility of reduced gross revenues because of lowered rates, if not offset by increased business

Discussion

A. N. Williams, general superintendent, M. St. P. & S. S. M., stated that his road had been investigating the possibility of securing a motor coach with a 15 ft. compartment for the working of mail enroute in order to replace passenger trains on which little traffic now remains other than mail and express. He expressed doubt regarding his road's inability to eliminate these trains unless some such provision was made for the handling of mail. In reply Mr. Steinberger and T. B. Wilson, S. P., pointed out that the railways are under no obligation to handle mail when other traffic becomes unremunerative but that this is an obligation of the postal department. Mr. Wilson stated that in numerous instances, his road's motor coach routes had been made star routes by the post office department at fairly compensatory rates.

Operating Aspects of Water Service

By C. R. Knowles

Superintendent Water Service, Illinois Central, Chicago

The many problems of railway water service should be the concern of every operating officer. An adequate, dependable and efficient water supply is one of the most important factors contributing to the economical movement of trains.

It is not always easy to provide the requirements for water within a reasonable cost. The question of availability of water supplies is seldom considered by the engineer who locates a railroad. Consequently, the water engineer must make the best of conditions as he finds them, using existing water supplies, developing supplies from wells or reservoirs, piping them to the desired location from a distance, or treating unsatisfactory waters to make them fit for use.

The time lost in stopping for water has become of constantly increasing importance in the operation of passenger and freight trains.

The shortening of passenger schedules is constantly becoming more intensive, and, whenever the time is shortened, the elimination of unnecessary stops for water becomes imperative. Heavier freight trains are likewise being operated on faster schedules and also require careful study to control the number of stops made for water.

Water station facilities are designed and constructed by the engineering department. Tanks or water columns for the delivery of water to locomotives are usually located by the transportation department. The water capacity of engine tenders is generally determined by the mechanical department. Thus it is apparent that efficient operation with regard to stops for water necessitates the closest co-operation between these three departments. The advantages of eliminating stops are sometimes far reaching. In addition to the loss of time in bringing the train to a stop and regaining the original speed, it is not unusual, on heavy tonnage trains, to detach the locomotive from the train when taking water, and this involves further loss of time to recharge the train line. It is also necessary sometimes to cut trains for crossings in making a stop for water where an important highway crossing would be blocked.

One way to reduce water stops is to increase the size of engine tenders. A study of the results obtained by installing larger engine tenders on ten different railroads throughout the United States is to the point. The average length of engine district included in this study was 150 miles, and the average freight train load was 4,550 tons. The average time saved per water stop was 26 min. There was also a saving of 910 lb. of coal and 770 gal. of water for each stop eliminated. This resulted in a reduction of time between terminals, with economies in the various items of operating expenses.

There are still other advantages in eliminating water stops. One is the possibility of selecting less expensive and more satisfactory water supplies. Another is the reduction in expense for water through reducing the number of water stations required. The proper spacing of water stations will also effect an increase in gross ton miles per train hour by the acceleration of train movement and the elimination of delays caused by stops for water.

Careful consideration of tender capacities and the location of water stations, however, are not enough. They must be followed by strict supervision of water stops. The purpose of providing engine tenders of 15,000 to 18,000 gal. capacity is lost when stops are made to take 1,500 to 2,000 gal. of water; yet this practice is by no means uncommon. It is difficult to show a return on an investment of $50,000 or more for an interlocking plant to eliminate train stops when an engineman will stop a few miles away to take water, whether he needs it or not.

Nothing will demoralize train movement so quickly as the failure of a water supply. It is difficult to express in dollars and cents the value of an uninterrupted supply of good water to the operation of trains. The cost of running for water has been variously estimated at from $0.20 to $1 a minute. Either figure probably represents actual cost under certain conditions. It should not be at all difficult to convince an operating officer that any reasonable expenditure for water service that will prevent train delays can easily be justified.

Quantity and Quality

Railway water supplies and facilities for handling water should always be provided to take care of the peak loads. The peak load may occur with regular frequency and thus be anticipated, or it may occur through a temporary interruption to service or congestion of trains or from other causes.

One of the most important factors in providing for a temporary increased demand for water is ample storage. In most cases, pumping facilities and pipe lines are designed so that all the pumping can be done in an 8 or 10 hr. shift. This arrangement, however, necessitates a storage capacity that will not only carry over the period between shifts but should also provide a reasonable margin against excess demand for water.

Water for locomotives is treated, either in complete treating plants or by chemicals applied to the water as it enters the locomotive, at more than half of the 20,000 water stations in use on American railroads. A total of nearly 200,000,000,000 gal. of water is treated annually. The cost of this treatment is more than $10,000,000 a year and is a substantial portion of your cost of operating trains. A large part of the saving is in the cost of repairs to locomotive boilers, but by far the greatest part of the saving is in the cost of train operation. In view of the large sums involved, the question of maintaining and operating these facilities properly should receive very careful attention.

The railroads in the western part of the United States have taken the initiative in the treatment of boiler waters for it is in this territory that it has been possible to show the most marked improvement. However, the benefits of treating poor water supplies, both in the maintenance of locomotives and in improved operating conditions, are becoming more generally recognized throughout the entire country.

As treatment has been extended to include most of the bad waters, the water that was considered fair a few years ago has become the poor water of today. The value of water treatment is well established through records of savings in boiler repairs, fuel economies and the reduction of engine failures. As train loads become heavier and boiler pressures are increased, it is apparent that treatment must be extended to include the water of so-called fair quality. The cost of providing adequate motive power for the movement of trains is constantly increasing. With investments of from $75,000 to $100,000 each in locomotives, poor water conditions can no longer be tolerated. Long engine runs are another factor in locomotive operation necessitating better water conditions. Better water is not only an economic necessity, but in many cases, it is an actual operating necessity.

Some of the improvements in the quality of water will, no doubt, be accomplished through the development of new sources of supply, but in the majority of cases, they will come through the improvement of existing supplies through treatment.

The amount of water used by railroads exceeds all other materials used, both in volume and weight. The annual consumption of water is approximately 620,000,000,000 gal. of which 432,000,000,000 gal. are furnished locomotives at nearly 20,000 water stations. The annual expense for maintenance and operation of water stations is nearly $50,000,000.

As with other commodities, it is obviously impossible to avoid a certain amount of waste. Water waste is of particular importance to superintendents who are interested in operating expenses. As an example of what can be accomplished in a campaign against water waste, one Middle Western railroad has succeeded in reducing its city water bills alone approximately $200 per day. Similar savings are possible in almost every instance where the subject of water waste is given proper attention.

Operation and Maintenance

The forces that are charged with the operation and maintenance of water stations are usually a part of the division organization. In some cases, the responsibility of the force is divided between water supply and other duties, but in most cases, water service is of sufficient importance to justify a distinct and separate organization.

The maintenance of the division water supply should be under the direct charge of a supervisor, with the necessary force of repairmen and pumping station attendants. The territory assigned to the repairmen should be such that they can keep in close touch with the various water stations in their territory. The division supervisor of water service and the repairmen should also be in constant touch with the train dispatcher in order that prompt action can be taken in the event of a threatened interruption to water service. Water department forces should at all times co-operate with the train dispatcher in order to arrange for making repairs at times when trains will not be delayed on account of inability to get water. This applies especially to the cleaning of tanks, the overhauling of tank outlet rigging and water columns, and similar work. All such work can be systematized to great advantage. Freezing temperatures in cold climates must be anticipated and proper protection provided against frost, in order to avoid delays through frozen tank fixtures, water columns or other facilities.

The best of mechanical facilities cannot be expected to give satisfactory service unless properly operated and maintained, and an organization with a definite responsibility is the first essential to the successful operation and maintenance of railway water stations.

Tests show that freight locomotives will consume from 75 gal. to 140 gal. per thousand gross ton miles. The average consumption of water per passenger train mile is from 40 to 80 gal., depending upon the tonnage of the train, the rate of evaporation and area of heating surface, the type of engine and other conditions.

The cost of water for locomotives for different classes of service varies in different parts of the country. The cost of water for freight locomotives on one Middle Western railroad, handling nearly 20,000,000,000 net ton miles of freight annually, averages about 3-1/3 cents per 1,000 ton miles, and the cost per passenger train mile averages about 1 cent. The cost of water per switch engine mile on the same road averages 1-2/5 cents per engine mile.

Remarkable development has been made in water service in the past few years. Larger and more efficient pumping equipment, pipe lines, tanks, and other facilities have been provided to take care of the increased requirements for water. New supplies have been developed and objectionable supplies treated to improve the quality of the water used. Larger water columns and tank spouts capable of delivering water to locomotives at the rate of 4,000 to 5,000 gal. per minute have been installed. Greater care in the use of water has resulted in material economies, all with the object of increasing the gross ton miles per hour, speeding up the movement of passenger trains, and decreasing the cost of train operation.

There is still a great deal to be done in improving railway water supply and its delivery to locomotives, not the least of which is the elimination of unnecessary stops for water and resultant delays. Increasing the size of locomotive tenders is one of the most important factors, and while it may mean considerable expense when applied to existing locomotives, the cost can be justified in many instances, and certainly in every case where new locomotives are purchased. A careful study of existing conditions with a view of eliminating unnecessary stops is of first importance and will speed up train movement and show material economies without any expenditure.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading amounted to 1,069,089 cars in the week ended June 15, an increase of 66,276 cars as compared with loading in the corresponding week of last year and of 52,610 cars as compared with the total in the corresponding week of 1927. Loading of livestock only showed a decrease from the two preceding years. Loading in all districts was higher than a year ago. For the week ended June 8 loading amounted to 1,054,792 cars, an increase as compared with loading in the corresponding week of last year of 59,222 cars, and an increase of 26,425 cars as compared with the corresponding total in 1927. The summaries for the two weeks as compiled by the Car Service Division of the American Railway Association, are as follows:

Revenue Freight Car Loading

Week Ended Saturday, June 15, 1929

Districts	1929	1928	1927
Eastern	248,408	230,923	235,707
Allegheny	224,648	206,587	208,247
Pocahontas	60,309	54,118	58,835
Southern	142,733	142,204	149,534
Northwestern	170,295	162,591	162,913
Central Western	142,452	136,446	133,020
Southwestern	80,244	69,944	68,223
Total Western Districts	392,991	368,981	364,156
Total All Roads	1,069,089	1,002,813	1,016,479
Commodities			
Grain and Grain Products	42,160	33,989	38,667
Live Stock	23,511	24,774	25,837
Coal	158,149	143,940	155,798
Coke	12,257	9,709	10,368
Forest Products	70,808	66,363	69,421
Ore	74,748	66,609	65,428
Merchandise L.C.L.	261,579	259,237	258,464
Miscellaneous	425,877	398,192	392,496
June 15	1,069,089	1,002,813	1,016,479
June 8	1,054,792	995,570	1,028,367
June 1	971,920	934,673	911,510
May 25	1,061,416	1,021,403	1,026,789
May 18	1,046,179	1,003,288	1,027,498
Cumulative totals, 24 weeks	23,432,168	22,470,714	23,481,542

Week Ended Saturday, June 8, 1929

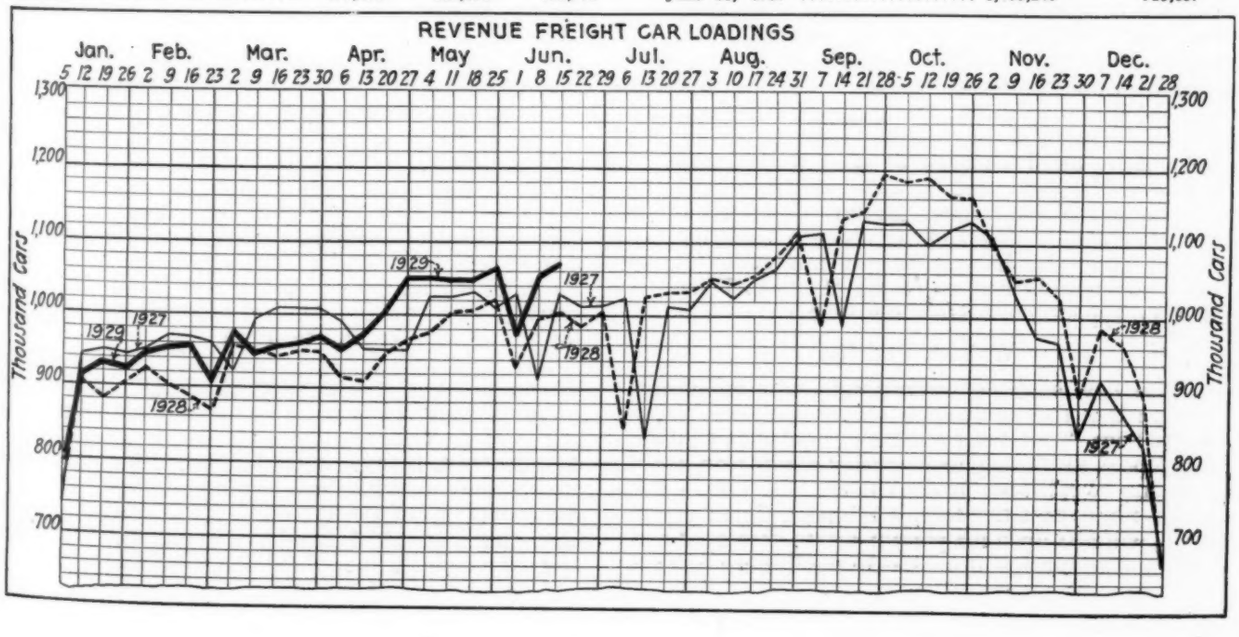
Districts	1929	1928	1927
Eastern	243,742	230,110	237,392
Allegheny	219,768	204,590	209,444
Pocahontas	58,941	55,897	61,888
Southern	144,706	136,918	148,551
Northwestern	174,799	161,728	165,367
Central Western	137,801	135,791	134,974
Southwestern	75,035	70,536	70,751
Total Western Districts	387,635	368,055	371,092
Total All Roads	1,054,792	995,570	1,028,367
Commodities			
Grain and Grain Products	38,955	34,254	40,903
Live Stock	24,451	27,764	26,807
Coal	153,242	151,032	158,821
Coke	12,176	9,653	10,681
Forest Products	69,963	64,224	69,957
Ore	79,454	66,618	66,778
Merchandise L.C.L.	260,292	256,171	258,275
Miscellaneous	416,259	385,854	396,145

The freight car surplus averaged 249,201 cars during the period ended June 15, as compared with 242,411 cars on June 8. The total included 126,581 box cars, 74,792 coal, 26,932 stock and 14,549 refrigerator cars.

Car Loading in Canada

Revenue cars loaded in Canada during the week ended June 15 totaled 75,457, being 1898 more than the total for the preceding week and 7067 greater than the total for the similar week in 1928. Totals, as compiled by the Dominion Bureau of Statistics, follow:

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada		
June 15, 1929	75,457	39,652
June 8, 1929	73,559	38,814
June 1, 1929	73,583	38,774
June 16, 1928	68,390	37,022
Cumulative Totals for Canada		
June 15, 1929	1,556,932	1,025,078
June 16, 1928	1,527,210	950,536
June 18, 1927	1,453,243	925,637



I. C. C. Asked to Consolidate Eastern Merger Proceedings

WASHINGTON, D. C.

AFTER struggling for several years with various plans and applications filed by the railroads looking to consolidations of railroads or groups of railroads into single systems the Interstate Commerce Commission now has before it for decision a question as to the extent to which it should consolidate its consolidation proceedings.

The Wabash, in various petitions which it has filed with the commission, has been seeking to have a plan of its own, which it said it proposed to file shortly for the creation of an independent system or systems in eastern territory, combined for purposes of hearing with the applications which had previously been filed by the Baltimore & Ohio, the Chesapeake & Ohio, the New York, Chicago & St. Louis and the Pittsburgh & West Virginia, some of which include some of the same roads desired by others, and that the proceedings be consolidated and integrated with those in Docket No. 12,964 on the tentative consolidation plan issued in 1921, which it asked the commission to re-open. The commission on June 17 announced its denial of the Wabash petition to re-open the general consolidation case, which has never been officially closed, and on June 26 it made public the Wabash petition for a consolidation of the separate proceedings together with answers opposing such a procedure on behalf of the Baltimore & Ohio, the Nickel Plate and the Pittsburgh & West Virginia.

When Congress adjourned in March without having taken any action to amend the provisions of the present law requiring the promulgation of a consolidation plan, which the commission for four years had asked to have repealed, the commission felt compelled to proceed without further delay toward the preparation of a "final plan" to succeed its 1921 "tentative plan." Commissioner Porter, to whom the consolidation docket was assigned which had for several years been under the charge of Commissioner Hall, is known to have submitted to the commission some kind of a memorandum in the nature of a plan or recommendations for making a plan, but it is understood there is no probability of action on it by the commission in the near future.

Meanwhile many controverted questions as to the disposition of various eastern lines have been placed before the commission by the separate applications filed by the B. & O. and C. & O., which are in general accord with the "four-system" idea, while the "fifth system" idea is supposed to be represented by the plan to be filed by the Wabash, which includes the Wheeling & Lake Erie, the Pittsburgh & West Virginia and the Western Maryland, and by those already filed by the Pittsburgh & West Virginia for authority to acquire the Wheeling & Lake Erie and the Western Maryland. The Nickel Plate also has pending an application for authority to acquire control of the W. & L. E. and the B. & O. application includes the Wabash.

Wabash Petition

"It is now generally understood," says the Wabash petition that the commission consolidate these various proceedings, "that the commission is about to promulgate a plan, technically denominated a final plan, for the grouping of railroads in the United States or in Eastern or Trunk Line territory, which plan, if now promulgated, will rest upon the present record developed many years ago and which at least as to the Eastern or Trunk Line territory has been vitally affected by subsequent independent action and stock purchases of certain carriers and individuals and banking interests associated with them. Such a record, the Wabash Railway Company respectfully represents, will be incomplete and inadequate and will not truly represent conditions in Eastern territory as they exist to-day." The petition also maintains and insists that "no four-system grouping in eastern territory, such as is proposed by certain of its competitors, is humanly possible without such merging of strictly competitive lines, such suppression of established identities in transportation service, such distortion of existing channels and such disruption of trade adjustments as to defeat fundamental safeguards of the Transportation Act."

Baltimore & Ohio

The Baltimore & Ohio in its answer says in part: "It is a matter of public knowledge that nearly 50 per cent or more of the capital stock of the Wabash Railway is owned or controlled by the Pennsylvania Railroad Company, or Pennsylvania Company, or interests closely allied with it. It is submitted that the complete situation as between the Wabash Railway and the Pennsylvania Railroad Company with particular reference to the proposed plan, should be more clearly, fully and frankly stated before said petition should be entertained. As it is alleged that the action of the Wabash Railway Company is taken in the interest of its stockholders, the commission, before receiving the petition, should require full information to show what, if any, stockholders have approved the action and the extent and character of their approval." Until the Wabash plan shall have been developed and is ready for actual tender to the commission," the Baltimore & Ohio says, "the commission is not in a position to determine the desirability or propriety of granting the request of petitioner and the Baltimore & Ohio application "is one involving a special proposal which seems to require that it should be heard and determined as and of itself."

"The commission, acting under the provisions of the transportation Act of 1920, promulgated a tentative plan and held numerous and extensive hearings upon the same, and said petition affords no grounds to make it necessary or desirable in connection with the final plan upon the preparation of which the commission is now understood to be engaged, to re-open Docket No. 12,964 and to consolidate Finance Docket No. 7450 therewith and hear the same together. Said final plan should first be promulgated by the commission. The commission may thereafter, upon its own motion or upon application, re-open such final plan for such changes or modifications as in its judgment will promote the public interest."

The Nickel Plate answer says the petition of the Wabash is dilatory and that the procedure proposed is contrary to the provisions of the act which contemplate that after the hearings upon the tentative plan of the commission have been closed a plan based upon those hearings shall be adopted before the subject is re-opened for any changes or modifications.

The Pittsburgh & West Virginia in its answer takes the position that it is entitled, as of right, to have the complete issue presented in its applications tried on the merits of the case, and the relief prayed for granted or denied, which it says cannot be done if its applications are consolidated with those of the B. & O., C. & O. and the application of the Wabash, or the general proceedings, "none of which involve the complete issue presented by each Pittsburgh & West Virginia application."

Railway Supply Officers Hold Annual Convention

Shoup and Aishton talk at San Francisco meeting — Terminal storekeeping scored—Efficiency of stock books challenged

THE Purchases and Stores Division of the American Railway Association celebrated its tenth anniversary and the former Railway Storekeepers' Association its twenty-fifth anniversary, and at the same time honored the Southern Pacific and Union Pacific lines for the support given to the Division's work in past years by holding this year's convention in San Francisco, Cal. It is the first occasion when the association has met on the Pacific coast, and for that matter, west of the Mississippi river.

The convention was largely attended, the number of members registered exceeding 350, and will go down in the history of the Division as one of its most interesting and profitable convocations. For the accommodation of eastern delegates, two special trains from Chicago with connecting cars from St. Paul, Minn., Omaha, Neb., and St. Louis, were operated to San Francisco via the Chicago & North Western, Union Pacific and Southern Pacific.

Stopovers were made at Salt Lake City, Utah and at the stores and shops of the Southern Pacific at Sacramento, Cal.

The business session began at nine o'clock Monday morning under the direction of the chairman, C. C. Kyle, purchasing agent of the Northern Pacific, and continued until 1:30 p.m. each day until June 26. The sessions were opened by addresses from Paul Shoup, president of the Southern Pacific, Pacific System, and R. H. Aishton, president of the American Railway Association. The proceedings were distinguished by a comprehensive report on the purchase and handling of supplies for dining cars and restaurants and a searching analysis of terminal railway storekeeping methods, while outstanding papers were read on the problems of discounting supply bills and on a system of stock control which challenged the continued efficiency of the time honored use of stock books in railway supply work.

As a result of the election, W. Davidson, general storekeeper of the Illinois Central, was advanced to chairman, and C. E. Walsh, purchasing agent of the Pennsylvania, was chosen vice-chairman for the ensuing year.

Following are abstracts of the reports and papers presented, together with a verbatim report of the discussion:

Paul Shoup Addresses Convention

Paul Shoup

Shortly after calling the convention to order, Chairman Kyle introduced Paul Shoup, president of the Southern Pacific Company, who spoke of the work of purchases and stores officers in part as follows:

"I presume there is no one here who doesn't realize how great an interest every railway management takes in the department that you represent. Your activities are of great consequence to all railroads, large or small.

"To my mind, the stores department is a great deal like a treasury in which dollars are flowing in and out constantly and the extent to which the current moves as it should move is largely dependent upon you. Always there is just a little leak; that is to say, the volume of values that flow into these stores outside of market changes are a little greater than those which go out, because one factor in business is working constantly against your efforts. Collis P. Huntington used to say that he knew only one element in business that never took a vacation, that worked holidays, Sundays, 24 hours every day and didn't hesitate to demand double pay for overtime, and that was 'Old Man Interest.' You have that constantly to contend with.

"If on a large railroad you have stores, we will say, that aggregate twenty millions of dollars in value, then interest at the rate of five per cent totals one million dollars per annum. If you succeed by having this stream of values flow as rapidly as possible through these stores, and if the purchasing department with its great knowledge of conditions, both as to markets on one side and demand on the other, exercises the best possible judgment with respect to purchases, then perhaps this twenty millions of dollars may be reduced to fifteen millions and you have saved the interest on five million dollars per annum, which at the rate of five per cent is something like $250,000. That is net. It helps the earnings of your company to the extent that four or five times that much added revenue would do.

"You have great problems in that connection. You must have a sort of second sight to anticipate what the demands of the various departments are going to be. You have to watch every supply to see that no part of this stream gets into an eddy.

"Every single lapse falling short of the maximum efficiency in the direction of a minimum stock means a loss of interest or return upon the investment. But it involves more than that. It involves the use of unnecessary space in buildings. It involves a lot of clerical labor and perhaps manual labor that should be avoided. You must also have a personal association with all the people who can give you the best information as to the

trend of markets that will lead you to carry the least possible stock at all times.

"More and more you are in touch with market conditions and you are following the general trend of the future supplies and probable cost of the articles in use in railroad service to a greater extent than ever before. That involves problems not only statistical, but analytical, which come directly within your province. I do not know of any men who can render such a great service to the railways as the purchasing agents can if they make themselves familiar through constant study with what is going to happen in the future.

"I know many of you offer valuable suggestions to your vice-presidents in charge of operation and other officers of like capacity when they come to you with questions of buying, but you can go a little further in some instances, and out of your experience and observation, suggest to some department head that perhaps something else or some other form of activity will achieve this result, if the thing that he wants is going to be rather expensive at that time.

"I know from my own experience also how alert and persuasive you have all become in making officers believe that no item is obsolete and that, having been purchased, it should be used.

"We all look forward with a great deal of confidence to an ever widening range of those activities in the sense that on the purchasing side there is no limit to what you may undertake until you have the most thorough possible knowledge of the markets that affect the things you purchase in general and in detail.

"As you direct your study to future costs and possible changes in the uses of materials, you will render a still greater service to your railway by becoming more and more familiar with the use of those articles, by constantly putting yourself in the place of the man who has to be responsible for their use and who is accountable for operating expenses."

R. H. Aishton Urges Association to Further Efforts

R. H. Aishton

At the conclusion of Mr. Shoup's address, Chairman Kyle introduced R. H. Aishton, president of the American Railway Association, who congratulated the members of the association on the progress they had made in the reduction of stocks, and then emphasized the necessity of every member being alert to effect still further economies as opportunity offered. Mr. Aishton's address to the convention delegates is quoted below in part.

"Our task is to keep one lap ahead all the while, whether it is in purchases or methods of operation, speed or efficiency. That is particularly important at the present time when all of the new forms of competition are coming in. We have competition by motor, the highways, air and the waterways. With all these the railroads will remain the backbone of transportation. But it is up to everybody who has anything to do with the railroads to see that methods of efficiency, of economy, and of everything that goes to make perfect service, is up to the minute.

"At the end of the war the stocks of materials on hand amounted to $755,000,000 in value. On December 31, 1928, their value was $474,000,000, a reduction of about $280,000,000. At five per cent the saving represents about $14,000,000 in interest alone.

"It is said that the war was an abnormal period. That is true. In 1916 the value of the railroads' stocks of material was as low as it was last year. But the prices in 1928 were very materially higher than they were in 1916, while the traffic moved by these railroads had increased from 1916 to 1928 by 20 per cent, which makes the record of 1928 show up well.

"Everybody is talking about what good transportation we have in this country. The shippers say it is wonderful. But we are apt to get a feeling of self-satisfaction, and self-satisfaction is one of the most dangerous things in the world.

"Last night I went through your reports to see the work the Purchases and Stores Division has been doing. It pleased me to see that you are far from satisfied with yourselves and that you have set a goal for

Storehouse Materials on the Union Pacific at Portland, Ore.

next year and for the next five years, and for the next ten years, that is going to be of the greatest help to the transportation companies in holding their own. As I left Washington, I noticed a statement the Interstate Commerce Commission issued on the operation of the railroads in the United States for the first three months in 1929, in which an asterisk was marked opposite almost every item in the list, with a footnote explaining that the marks meant 'the best record ever made by the railroads in their history.' The one item that did not carry the star of merit of the Interstate Commerce Commission was the loading of cars. It showed a decrease and it has shown an almost continual decrease for some time. You can help the railroads aside from your purchasing and stores work, for in addition to being purchasers and handlers, you are the greatest receivers of freight of any institution in the United States or Canada. There is a tremendous field before the railroad men today in getting heavier loading of cars. We are asking you to see if you can't get your cars loaded nearer to capacity than they have ever been before.

"Mr. Shoup spoke for the railroads in the West. I think I can safely speak for the railroad executives of the United States, Canada and Mexico in saying to you that they have the most hearty appreciation of what you have accomplished in your work during the ten years that you have been actively engaged in it. They admire the results you have obtained and your determination to keep on with the good work."

The Address of Chairman Kyle

Good will the keynote of opening remarks to the supply convention

In giving an account of my stewardship during the past year, I desire to express my appreciation of the honor bestowed upon me.

This is our tenth anniversary and the first time that the Division had held its annual meeting on the West Coast, and it is also the first time that many members have seen the waters of the Pacific. This is also the twenty-fifth anniversary of the former Railway Storekeepers' Association. The warmth of our reception has justified the selection of San Francisco.

C. C. Kyle

The success or failure of this convention depends largely upon the faithful attendance of the members at all sessions and to their aggressiveness in the discussions of the many subjects. Let every member give his best during the working hours. I hope that every man attending the meeting will take home something which will repay his company many times over for the privilege and cost of his attendance.

Increasing Responsibilities

The importance of the work of the Division is growing each year and it devolves upon the individual members to consider the recommendations advanced. If the fundamental recommendations advanced are not an improvement over methods in effect, the objections should be expressed when the reports are presented. When adopted, they should be given a fair trial on the railroads we represent.

Pays Tribute to Farrell

Last, but not least, I wish to express my appreciation of the services of our secretary, William J. Farrell. To a very great degree the success of the division is due to his untiring efforts. He attends every meeting of all the committees, no matter where or when held, and I suggest a rising vote of appreciation at this time.

I wish to emphasize that part of the report of the general committee relating to stock reductions on Class Railroads in material and supplies, December 31, 1928, as compared to December 31, 1920. These reductions have resulted in a saving to member railroads of approximately $50,000,000. The members of the division have had considerable to do with this great reduction of material and supplies balances and I make this state ment fully realizing the importance of the co-operation received from our using departments.

We have three new committees this year—those on Terminal Storekeeping, Training and Selection of Employees, and on Commissary Problems. The reports of these committees will be considered during the coming sessions. They are all important and I am certain from the able manner in which they have been treated by the I Railroads in material and supplies, December 31, 1928, committees, that the results will be of benefit.

In the New Oil House of the Southern Pacific at Sacramento, Cal.

Report of the General Committee

Imposing reduction in inventories since 1920 augmented by actvities of the Division

The annual report of the activities of the Division, presented by the chairman and general committee at the annual meeting of the American Railway Association in New York during November, 1928, was supplemented with a statement of the reduction in materials and supplies for Class I railroads in December, 1927, as compared with December, 1926, and also with December, 1920.

Attention is called to the reduction in the Materials and Supplies Account, Class I railroads, for 1927, as compared with 1926, which amounted to $27,000,000; also to the reduction in the Material and Supplies Account for 1927, as compared with 1920, which amounted to approximately $237,000,000.

The annual expenditure for railway supplies for Class I railroads amounted to $1,395,938,000 in 1927, which is mentioned to indicate to a certain extent the responsibilities that are placed upon the Division.

To a considerable measure, these reductions are due to the co-operation of the using departments. At the same time, a substantial portion of that reduction is due directly to the Division's recommended standards and efficient practices for controlling of investments and in the handling of materials used by the railroads in the last few years.

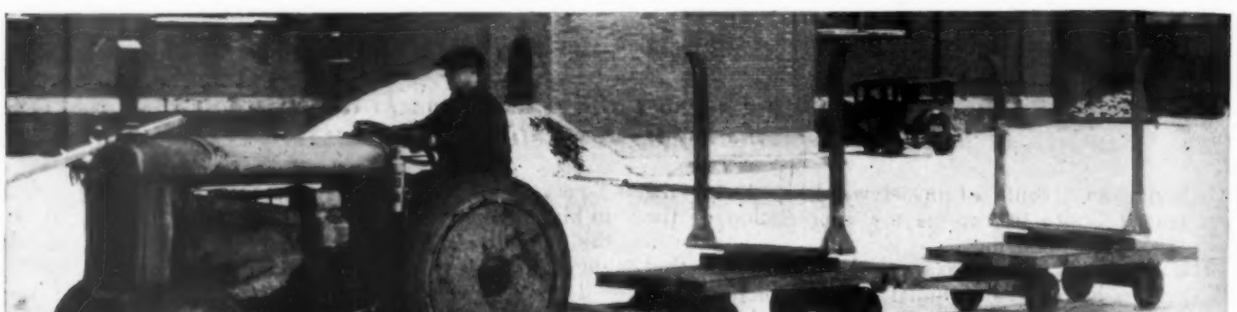
The attention of the members of the Division is directed to the Material Stock Report. This report was recommended for the purpose of providing a comparison of material balances on the basis of turnover for the information only of member railroads participating. The combined report contains valuable information for purchasing and stores officers and it is particularly desired that all members participate and receive this information.

The Division has continued its contact with the U. S. Division of Simplified Practice on subjects in which the Division is interested, through representatives from the Committee on Standardization and Simplification.

The special joint committee on reclamation, consisting of representatives from Division VI and the Mechanical Division, has continued its activities and is submitting a progress report this year. Considerable detailed study is being made by this committee on several reclamation operations and it is expected that the work will continue for an indefinite period.

Contact has been continued with the Railway Accounting Officers Association through the committee on Uniform Accounts, and the report of activities during the year is included in that committee's report.

By request of the general secretary of the American Electric Railway Association, contact has been established with that association for the purpose of studying the question of standard packages for materials.



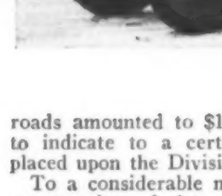
Material Handling Equipment on the Lehigh Valley at Sayre, Penna.

Nominations

The general committee offered the names of the following members as candidates for the committee on nominations for the ensuing year: L. C. Thomas, manager of stores, C. N.; J. G. Stuart, general storekeeper, C. B. & Q.; A. W. Munster, purchasing agent, B. & M.; J. L. Irish, general storekeeper, O.-W. R. R. & N.; W. J. Diehl, purchasing agent, M. & O.

Report on Store Department Rules

Revisions in methods of ordering materials for maintenance of way and equipment advanced



E. G. Ellenberger
Chairman

The committee recommended the following detailed plan for ordering material as an addition to the Standard Instructions Governing the Use of Stock Books:

When determining the quantity to be ordered, the following instructions will be observed:

Quantity on Hand: Quantity of material actually on hand obtained by actual count of stock;

Quantity Due: Quantity of material not received on previous orders;

Actual Consumption: The actual quantity consumed during the last 30 days;

Average Consumption: The average of the actual monthly consumption during the last three months. When a representative average cannot be obtained owing to a shortage of material, three months should be used to obtain the average.

Equipment Material

For Ordinary Maintenance: For ordinary maintenance, use the average consumption;

For Special Conditions: When the average consumption is not sufficient to meet requirements, due either to special inspection or increased program, use the following:

First Month: Use the average consumption plus a percentage to represent increased demands or an increased program.

Second and Third Months: Use the actual consumption unless it is low, due to a lack of material, in which event, use the average obtained from three representative months.

After Third Month: Use the average consumption.

When the average consumption is excessive for the requirements, either because of discontinuing special inspection or be-

cause of decreased consumption programs, use the following:

First Month: Use the average consumption less a percentage to represent decreased demands or decreased program.

Second and Third Months: Use the actual consumption.

After Third Month: Use the average consumption.

Maintenance of Way Material

Maintenance of Way Material is largely seasonal, and is further affected by construction programs. Experience has indicated that the trend of consumption is usually the same in certain months of the calendar year, and the table for obtaining the average consumption of maintenance of way material should be used when preparing orders.

For maintenance of way material ordered for stock, use the average monthly consumption of the previous year, as reported in the columns of the table giving the purchasing agent's required time of delivery, to the end that the order will represent the proper quantity to satisfy the consumption at the time of delivery. As an example, 45 or 60 days are required for the delivery of joint bars; orders placed in April are to protect July consumption, and the average monthly consumption of the months of the previous year under column headed 45-60 day. Opposite April should be the basis for obtaining the average. Months in which the consumption trend is the same should be used, whether consecutive or not.

storekeepers of the road for investigation and disposition.

Ordering Multiple

An ordering multiple is an arbitrary figure by which the average consumption is multiplied. It is expressed in months or fractions representing a combination of the month's supply of stock which should be on hand after the receipt of new stock, and the months or fractions required to effect delivery of material at destination, and includes the time required for the requisition to reach the purchasing agent. Following is the table of multiples to be used for the respective groupings according to the time required for delivery:

Ordering Multiples to be Used

Time Required to Effect Delivery	Material Groups 1	2	3	4
30 days	3½	3	2½	1½
45 days	4	3½	3	2
60 days	4½	4	3½	2½
75 days	5	4½	4	3
90 days	5½	5	4½	3½
105 days	6	5½	5	4
120 days	6½	6	5½	4½

To obtain the quantity to be ordered in Groups 1, 2, 3 and 4, multiply the average consumption by the proper ordering multiple and from this subtract the sum of the quantity on hand and due, adjusting the quantity to be ordered when necessary to the standard package, provided it closely approximates this quantity.

Ordering multiples are not provided for Group No. 5 on account of the non-activity of this group, but if it becomes necessary at any time to order, the quantities desired should be restricted to immediate requirements, and the material order accompanied by a specific explanation, stating necessity for ordering. The general storekeepers should arrange for the transfer of items from Group No. 5 to the more active groups when the activity of particular items warrants such action.

The ordering multiples as outlined and the instructions for their use cover normal conditions with which the local operating officers and storekeepers are familiar, but to meet certain conditions with which the local officers may not be familiar, the general storekeepers may from time to time advise that certain percentage deductions or additions should be

Table for Obtaining Average Consumption, M. W. Material

Month in which Ordered	Average Consumption for various delivery requirements of Purchasing Agent							
	30-Day		45-60 Day		75-90 Day		120 Day	
January	March April Nov.		March April Nov.		May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.
February	March April Nov.		May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.
March	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.
April	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.
May	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.
June	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	March April Nov.	
July	May June July	Aug. Sept. Oct.	May June July	Aug. Sept. Oct.	March April Nov.		Jan. Feb. Dec.	
August	May June July	Aug. Sept. Oct.	March April Nov.		Jan. Feb. Dec.		Jan. Feb. Dec.	

Careful consideration should also be given to deviations in programs for new rail, extraordinary maintenance and construction when using the previous year's consumption as an ordering guide. For seasonal materials, such as steam heat hose, snow brooms and shovels, snow melting oil, garden hose, grass seed, etc., use the actual consumption of the corresponding month of the previous year in which material will be delivered, plus the consumption of two succeeding months of the same year, divided by three to obtain the average.

All items of standard stock material may be placed in five groups as described below, according to their importance to the railroad. The stockcard description of items in Groups 1, 2, 4 and 5 bear these numbers. Items not so marked are considered as being in Group 3.

Group 1: Material necessary for uninterrupted service of the railroad and for the convenience of the traveling public.

Group 2: Material necessary for the uninterrupted operation of the company's shops, plants or yards, the lack of which would cause delay to uniform production work, or labor expense of considerable proportion.

Group 3: This group covers material desired at a specified time, the lack of which will not interrupt traffic or cause expensive delay in labor.

Group 4: Material for equipment, and maintenance of way material, of a type approaching obsolescence, which is desired at a specified time, the lack of which will not cause unnecessary labor expense. This is the group of material which causes dead or frozen stock if ordered too far in advance of the needs, or in quantities greater than immediately required.

Group 5: Material of which there has been no consumption for one year, and has become dead or frozen stock, and is that group of items which will normally be reported by the general

Table for Obtaining Consumption, M. W. Material

Month in which Ordered	Average Consumption for various delivery requirements of Purchasing Agent			
	30-Day	45-60 Day	75-90 Day	120 Day
September	March April Nov.	Jan. Feb. Dec.	Jan. Feb. Dec.	Jan. Feb. Dec.
October	Jan. Feb. Dec.	Jan. Feb. Dec.	Jan. Feb. Dec.	Mar. April Nov.
November	Jan. Feb. Dec.	Jan. Feb. Dec.	Mar. April Nov.	Mar. April Nov.
December	Jan. Feb. Dec.	Mar. April Nov.	Mar. April Nov.	May Aug. June Sept. July Oct.

made to the quantity which would normally be ordered by the use of these ordering multiples.

A short method for obtaining the quantity to be ordered, particularly for making certain percentage deductions or additions to the quantity which would normally be ordered, is given in the following tabulation:

Total Actual Consumption for Last 90 Days is to be	Factors for Multiplying Consumption when Ordering Multiple is								
	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Decreased by 10 per cent	.60	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80
Decreased by 20 per cent	.53	.67	.80	.93	1.07	1.20	1.33	1.46	1.60
Decreased by 30 per cent	.47	.58	.70	.82	.94	1.05	1.17	1.28	1.40
Used as is	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00
Increased by 10 per cent	.73	.92	1.10	1.28	1.47	1.65	1.83	2.01	2.20
Increased by 20 per cent	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40
Increased by 30 per cent	.87	1.06	1.30	1.52	1.73	1.95	2.17	2.38	2.60

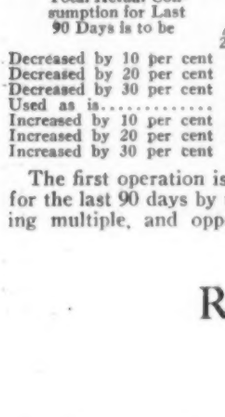
The first operation is to multiply the total actual consumption for the last 90 days by the factor shown under the proper ordering multiple, and opposite the actual or percentage increase or decrease to be made. The second operation is to deduct the total on hand and due. The result will be the quantity to order. In no case should quantities in excess of 1½ months' average consumption be ordered during any one ordering cycle without proper explanation, except for items in Groups 1 and 2, for which quantities in any ordering cycle should not exceed two months' average consumption. Quantities ordered must conform with the unit appearing in stock book description of material.

In view of the volume of work performed by past committees in the study of this subject and the unquestionable value of preserving this data, the committee reaffirms recommendations of former committees and stresses the importance of reprinting the Book of Rules in loose-leaf form.

The report was signed by E. G. Ellenberger (chairman), general material supervisor, Penna.; K. P. Chinn, assistant general storekeeper, S.P.-Texas Lines, J. H. Geary, superintendent of stores, Erie; E. H. Hughes, general storekeeper, K. C. S.

Report on the Classification of Materials

Divisions proposed for new railway supplies—Some railroads want changes



F. J. McMahon
Chairman

The committee submitted the following additions to the standard material classification as suggested by roads canvassed for opinions:

Item	Classification
Signs—sectionmen's signal	1-C
Buildings and parts—portable metal	3
Concrete—curbing	3
Concrete—rail rests	3
Concrete—watering trough	3
Plants—hot water, boiler washout, pumps and parts	9-A
Sand station and parts, excluding pumps and parts	9-A
Water treatment facilities	9-A
Machines, track oiler and parts	9-C
Machines, track mowing and parts	9-C
Machines—track spraying and parts	9-C
Machines—weed burners, exterminators and parts	9-C
Bars—reinforcing, iron or steel	15
Extinguishers—automatic fire for locomotives	23-A
Wings—cab windshield	23-A
Fountains—sanitary drinking and parts for passenger coaches	24
Flooring—metal for coaches	24
Lanterns—electric and parts	25-E
Pilots—locomotive wood	30
Boards—steel and wood running for stations	36-A
Boxes—engineers' oil can	36-A
Buttons—trainmen	36-A
Cabinets—towel	36-A
Dispensers—soap	36-A
Furnaces—for station and other buildings	36-A
Incinerators	36-A
Oil—road, for keeping dirt down	37
Oil—for oiling rails	37
Oil—for burning weeds	37
Gaskets—asbestos and fibre	46
Gloves—all kinds	46
Hose—acetylene and oxygen	46
Hose—metallic	46
Swabbing—cotton	46
Tape—gasketing asbestos	46
Carborundum	47
Cement—cast steel	47
Graphite—stick and flake	47
Remover—paint and varnish	47
Photographic—supplies and parts	48

A canvass of railroads also resulted in the following suggested changes in classification headings: That Class 21 now reading "Rough and finished brass castings and journal bearings." should be chainged to read "Rough and finished aluminum and brass castings and journal bearings."; that Class 9-A now reading "Fuel and water station material, and scales and parts," should be changed to read "Fuel, water and sand station material and scale parts." that Class 2-B now reading "Telegraph and Telephone Material." should be changed to read "Telegraph, Telephone and Radio Material."; that Class 26 now reading "Material peculiar to Gasoline and Electric Passenger Motor Cars, Automobiles, Auto-Trucks, Tractors, Power Trucks, etc.", should be changed to read "Material peculiar to Gasoline and Electric Motor Cars not specifically included in other classes, Automobiles, Auto-Trucks, Tractors, Power Trucks, etc."

Standard Classification Books

The present book includes all changes and corrections up to and including 1927. It is the intention to reprint this book when the present supply is exhausted, at which time the book will be revised so that it will include the recommendations of the 1928 and 1929 committees.

The committee has made no changes in classifications. It has added some items which were suggested by the roads canvassed but has not done so in all cases as it will be seen in the preface to this classification that the more important items only are listed.

It has been suggested by one railroad that the general index be gone over so that in all cases the noun will be shown first. The committee recommends that it be taken care of when the classification book is reprinted.

The report was signed by F. J. McMahon (chairman), general storekeeper, N. Y. C.; R. G. Benson, supervisor of classification, Erie; W. E. Evans, purchasing agent, G. T. W.; A. C. Johnson, district storekeeper, N. P.; J. S. Mathias, general storekeeper, T. & P.; A. R. Mullens, division storekeeper U. P.; H. J. Smith, chief clerk to general storekeeper, S. P.; Wm. Davidson (chairman ex-officio), general storekeeper, I. C.

Discussion

This report was presented by Chairman F. J. McMahon. L. F. Duvall (A. C. L.): Reinforcing bars are included in Class 3 of the present standards and I believe they should remain there.

Chairman McMahon: We had all the recomendations before us and we decided to the best of our ability that reinforcing bars should be under the classification recommended. I am quite sure the future committee will be glad to reconsider it.

J. C. Kirk (C. R. I. & P.): It seems to me that this is a maintenance of way item. If you put it in Class 15, it throws it into the mechanical group. Class 3 is more appropriate for that item along with cement, than Class 15.

Mr. Duvall: It is not a question of adding reinforcing bars to the classification. They are already in Class 3. As Mr. Kirk has just brought out, they are maintenance of way and not maintenance of equipment materials. We might as well add track bolts in Class 11, as to take reinforcing bars out of Class 3 and put them in Class 15.

J. F. Brown (Southern Pacific): The changes proposed in our present classification are becoming so numerous and so involved that only those experienced in classifications can properly classify material. Anything we can do toward dividing these classes and avoiding the use of subdivisions will make it better for all concerned.

Mr. McMahon: We shall be very glad to comply

with the feeling of the meeting and leave reinforcing bars in Class 3.

Mr. Kirk: I should like to call attention at this time to a discrepancy. Throughout our entire classification each major item and its parts are all in one classification. For instance air pumps and parts are in Class 22, while injectors, lubricators and parts are in Class 23-B. When the classification came out, insulated joints were in Class 1-B and the fiber for those joints was put in Class 2-A. I should like that discrepancy corrected.

Mr. McMahon: The committee will be glad to consider your suggestion.

Chairman Kyle: Mr. Kennedy, auditor of disbursements of the Southern Pacific is in the room and has something to say on this subject.

J. Kennedy (So. Pac.): I understand that the revision of the classification to reduce the number of classes has been before the committee for a number of years. In 1927 the committee submitted a classification of seventeen classes, but was not successful in getting that classification adopted. However, the standard material classification was revised and reprinted during 1927 and provided that "the subdivision of classes is optional and may be changed or revised to meet the needs of the individual roads, but it is recommended that the primary classes be followed except as changed by the association." Our purchasing and stores department tells us that the classification does not serve them for controlling material or making requisitions. The accounting department does not need the classification for accounting purposes. A great deal of money is spent in breaking down material received and issued into some fifty classes, with a number of sub-classes, and the only justification we can find for this money spent is that we are good soldiers in following the American Railway Association. Our association could probably adopt a resolution leaving it optional with the carriers to use any classification they choose, provided the classification will furnish information to the Division which will enable it to prepare its semi-annual comparative statement of material.

W. Davidson (I. C.): The committee has expressed itself as not being in favor of that suggestion, so it would be useless to ask it to grant that request.

A. S. McKelligon (So. Pac.): The suggested change came from the Southern Pacific. We wish to be allowed to consolidate these classes into ten or twelve classes. The suggestion was not made with any idea of changing the arrangement in the stores but for preparing statements. We desire to follow the practice which many other railroads are doing, but we have adhered to the recommendations of Division VI. The Committee found by canvass that only about half the Class I railroads are using the American Railway Association classifications. Some of them have no classification whatever. The purpose of this analysis is to give executive officers an idea how the stock is broken up. We feel that we have gone beyond the day when we have to have sixty classes. The cost of putting up this statement is excessive and we do not get the benefit of it. The comparative statement covers about twelve classes. That seems to be sufficient for a comparative measure between railroads.

Chairman Kyle; In all probability a great many railroads are not following strictly the American Railway Association classifications adopted some years ago. I come from a railroad that was reluctant to adopt that classification on account of the time and the money it took to change our system and stock books, but after we adopted the American Railway Association classification, you couldn't get a storekeeper on the Northern Pacific to go back to the old method. It is barely possible that the reason 50 per cent of the railroads are not using the American Railway Association classification is because they are afraid of the initial expense.

In the Reclamation Plant of the M-K-T. at Parsons, Kans.

Mr. McKelligon: I don't consider this a radical change in any way. We are not changing the classification as far as the arrangement of the material in the stores is concerned. The recommendation is merely to allow the railroads to set up on their balance sheet as many classes as they desire.

C. H. Murrin (I. C.): Everybody has the option now of doing more or less what they desire in connection with the classification, but we should not do anything with the classification to undermine it. Another Committee has adopted the grouping of twelve. For comparisons between railroads twelve groups seem to be all that are necessary and if a railroad wishes only twelve classifications, it has the option of using the twelve for accounting purposes.

Mr. Kennedy: We haven't asked for a change in the classification. As a matter of fact, we don't see the necessity for the classification for accounting purposes. If you give us the option of using the twelve classes or any other number of classes that we desire to use and permit us to work in harmony with the American Railway Association, we are satisfied.

George C. Yeomans: The idea of classification of material originated in the thought of attempting to secure uniformity in accounting. I can't see any reason for making any change in the present standard classification but neither can I see any reason why any railroad which prefers to reduce the number of classes from fifty to twelve or to increase it from fifty to one hundred fifty should not do it as long as it maintains the twelve distinct divisions that have been recommended and adopted.

L. F. Duvall (A C. L.): We took into consideration the American Railway Association classification and it cost us a lot of money to change our records, but we thought it well worth our trouble to change it. We consider the present American Railway Association classification very good. It helps us in every way. I wouldn't propose to change it because it is beneficial to us from an accounting standpoint and also from the standpoint of material stock control. I should like to see it remain as is.

W. H. Jones (N. Y. C.): It is not mandatory on the part of any railroad to follow the rules we adopt, but it has been my thought that once we adopt a rule or

resolution we should all endeavor to put it into effect.

J. G. Stuart (C. B. & Q.): The present classification is good but it is not good enough. We have reached the point when we should make such changes in our classification as will make it acceptable to a far larger number of railroads. It is easy to say that any railroad can take what it wants. Of course it can. Who is going to stop it. We are trying here to get uniformity and if the Southern Pacific takes one thing and the Burlington takes another, and the Santa Fe another, and the Northern Pacific another, we are going apart. I think we should get some action on this immediately so that we can all adopt it and expand it as we see fit in certain directions. The present classification does not meet the present needs of the railroads or more would have adopted it.

C. B. Tobey (L. V.): I move that the Committee's report be accepted.

M. M. Moffit (So. Pac.): I second the motion with the recommendation that the Committee consider revising the classification next year.

The motion was carried.

Report on Stock Comparisons and Expenses

Preparation and exchange of statistics on stock turnover advocated—Practice growing

C. H. Murrin
Chairman

The material stock report was adopted by the Division and approved by the Railway Accounting officers Association at their respective annual meetings in 1927 as a recommended medium through which constructive comparisons, valuable to the control of stock investments and for saving of carrying charges thereon, could be made of materials and supplies balances and stock turnover performances of individual railroads.

Originally it was considered that this report be prepared and submitted monthly or quarterly, but subsequently it was changed to a semi-annual report. The figures to be reported are as of June 30 and December 31 each year and it is desired that reports be submitted with 45 days.

The individual reports showing figures as of June 30, 1928, were received from railroads representing 52 per cent of the road mileage of Class I railways in the United States and in the United States and, in addition to the U. S. mileage, approximately 20,000 miles in Canada.

The committee is of the opinion that all railroad managements and their purchasing and storekeeping organizations compare materials and supplies balances of individual railroads to some degree to check their own operations. The material stock report with its grouping arrangement and turnover data, provides a constant simplified and practical medium for such comparisons and it is urged that contributions thereto be more widespread and also that returns should be made promptly to be of greater current value

Accounting Departments Should Help

It is recognized that in some cases, due to the accounting arrangement followed, the accounting department might be the agency to prepare the report.

At a joint meeting, the Railway Accounting Officers Association stated that the material stock report plan was approved as a recommended practice and it was indicated that where a purchasing department cannot compile the complete semi-annual report for the railroad such compilations would, in all likelihood, be assumed by the accounting department.

The following recommendations are made:

1—That this committee hereafter be composed of not less than seven members exclusive of the chairman, and that such members represent each of the following regions: New England, Great Lakes, Central Eastern, Southern (including the Pocahontas region), North Western, Central Western and South Western.

2—That regional committees be appointed for at least seven regions, and that such committees be composed of the number of members necessary.

3—That the chairman of this committee and the personnel pointed by the chairman of this committee and the personnel of such committees be subject to the approval of the chairman of this committee.

The function of the regional committee is to encourage enthusiasm and emphasize the importance of the material stock report, and likewise to improve its value from a statistical standpoint.

Comparisons with Cut Stores Expenses

The accomplishment of economical performances on materials procurement and distribution equals in importance efficient stock turnover, and greater progress toward economy of operation will be secured if ways and means are available for the comparison of stores expenses between carriers. Provision shall be made for reporting the handling expense per $1,000 off materials actually used in the material stock report.

The unit of performance, "Handling expense per $1,000 materials charged to close accounts" (materials actually used) was advocated in the joint committee report on this subject adopted by Division VI and approved by the Railway Accounting Officers Association at their respective annual meetings in 1927.

The practical value of such comparisons depends on the elements of expense included in such expenses. Two particular problems are cited: (1) the items charged to store expenses and (2) where, from a storekeeping standpoint, the physical distribution of material ends. Outstanding items in connection with the first case are supply car or train operation, store delivery and accounting expenses for materials received and disbursed. The second case is concerned, for example, with "storekeeping" in connection with unapplied materials stocks not included in stores department stocks or stocks cared for and distributed by using department employees.

The report was signed by C. H. Murrin, (chairman) special accountant, I C.; O. W. Browne, assistant to purchasing agent, A. C. L.; D. V. Fraser, assistant purchasing agent, M-K-T.; E. Harty assistant general storekeeper, S. P.; L. Kilmer, chief accountant, C. N.-G. T. W.; W. H. Morris, general storekeeper, Reading; W. W. Morris, assistant general purchasing agent, Penn.; L. Sutherland, general storekeeper, P. & L. E.; A. L. Sorensen (chairman ex.off.), manager of stores, Erie.

Discussion

A. S. McKelligon (So. Pac.): I have a stock report that Mr. Farrell got up with the figures presented to him but I don't understand some of them. One railroad shows the disbursement of more stock than it has on hand and yet it shows about 60 days' stock. Another road shows disbursements of materials and parts to manufacturers to the amount of nearly $3,000,000 and uses this disbursement in figuring the number of days' supplies. Still another company has a total disbursement of $25,000,000, with stock on hand of $23,000,000.

Chairman Kyle: There are inconsistencies in this printed report for the reason that we have no uniform method of figuring the day's supply.

Mr. Murrin: There are instructions showing how to figure the day's supply. The On Hand column should show the value of the stock segregated by the different groups as of June 30 on one six months' report and as of December 31 on the other report. The instructions specify that the disbursements during the preceding six months also segregated by groups should be averaged and then divided by thirty and that result divided

into the stock on hand to get the day's supply. The instructions clearly specify that transfers are not to enter into that report.

Chairman Kyle: This emphasizes the necessity of thoroughly understanding the instructions. We have had quite a struggle to prepare this report. Many railroads have failed to contribute. The principal reason advanced was that it took too much time. Those who are following the straight American Railway Association classification found little trouble in presenting the information and it is the general understanding among the present General Committee that unless a deeper interest is shown by the large railroads next year we should discontinue the report.

The report was adopted without further discussion by the convention.

Discounts for Cash a Factor in Good Buying

Large savings possible with better understanding of trade terms and practices

By F. S. Austin
Purchasing Agent, Boston & Albany

© Bachrach

F. S. Austin

When a buyer receives goods from a seller on condition that he will pay for them in the future, a credit relationship is usually established, allowing a certain period of time, such as 30 days, within which payment of the amount of the bill is due without being subject to deduction which is known as the net period, and also a period of time, usually 10 days, within which the deduction of a cash discount is permitted from the amount of the bill, known as the cash discount period. The terms in each line of business are regular and are recognized. They may be the result of recommended practice by trade organizations, a natural growth over a period of time, or it may be set up by large sellers.

There are two kinds of discount, trade and cash. A trade discount is a price adjustment granted all buyers irrespective of time and payment, while a cash discount is a premium offered by the seller to the buyer. The size of the cash discount should be considerably in excess of current rate of interest, so that borrowing from the bank in order to secure the discount would be profitable. Where terms are net 30 days and the discount period 10 days, one-half of 1 per cent discount is equivalent only to 9 per cent annually, while 2 per cent is equivalent to 36 per cent annually. From the above, it can readily be seen that ½ of 1 per cent being too close to current rate of interest, would not be of interest to the buyer.

A Means of Credit Standing

Cash discounts, being somewhat higher than the current rate of interest, will be taken by every buyer who can possibly do so, either with his own funds or those borrowed from his bank. In other words, it is taken by buyers with a superior credit standing. It furnishes the seller with a means of judging the credit standing of customers and also eliminates the credit risk on a considerable part of the accounts. Where the buyer borrows from the bank in order to take cash discounts, the bank necessarily measures his credit. Where the seller sells on cash discount terms, the risk of the seller is small, but when the buyer takes net terms, then the seller assumes the risk as it is necessary for him to use his own funds or go to the bank and borrow, and he cannot do the latter unless his credit is good.

The length of the cash discount period is usually 10 days and is that time which it takes for goods to arrive at destination. In addition, it gives the buyer an opportunity to examine and check his shipments. This varies somewhat with the nature of the article. Standard goods do not require the same careful examination as those which are not standard, and where the general competitive conditions are upon a high plane, the buyers are not under the necessity of insisting, in all cases, upon inspecting the goods before paying for them. An exception to this is lumber which needs careful examination and different provisions are, therefore, made in the terms governing its purchase.

The size of the cash discount varies with the article, the rate of turnover of the article, as well as with the credit position of both the buyer and the seller. Slower moving articles usually carry a higher discount. As a general rule the poorer the credit risk the higher is the discount offered. Where an industry sells to two classes of buyers, the discount to one group may be greater than the discount to the other, although the net terms are the same. The greater the degree of manufacturing work on an article, moreover, the larger is the discount that is usually quoted. This is because the articles are bought in smaller lots and turn more slowly and the buyers are smaller and poorer risks. If the seller's position is weak, he may offer a higher discount in order to secure payment. Some manufacturers or sellers, after having been in business for a period of years, reduce their cash discount offered as their financial or credit position becomes stronger. The size of the cash discount will also vary with the seller's margin of profit.

The Railroads and Cash Discounts

The railroad holds a peculiar position in the business field. With freight rates regulated by the government and with seller's bills practically guaranteed, the risk to the seller is a minimum. The relationship between buyer and seller is regular. Competition is keen. Goods are purchased for current use and not for resale. Also many of the articles are adaptable only to railroad uses. With the special character of the service rendered, certain concerns deal only in railway supplies. Other concerns confine their sales to railroads, or at least do the majority of their business with them. Such concerns usually quote net terms.

The terms granted on all other materials vary with the commodity and usually are in line with the terms in general use in the particular industry and vary with the size of the buyer and seller, their credit position and general competitive conditions. Many sellers are careless in quoting terms. Some do not quote terms at all, yet abide by terms in general use in their field. Those handling bills in purchasing offices should be familiar with such terms, otherwise, they will fail to take advantage of the discount. Others quote a destination price payable in 30 days with 2 per cent off for payment in 10 days, when, in reality, these terms were intended to include the freight reduction. Most sellers prefer to quote railroads a mill price or mill price with freight allowed, thus turning over the material to the buyer at the shipping point and enabling the seller to render bills with a cash discount period of ten days from the date of the shipment or the invoice. This is usually a sufficient period for the material to reach its destination, to be examined, checked and the bill paid by the buyer. Railroads dealing largely with reputable houses do not necessarily secure acknowledgment of the receipt of the material from their storekeepers, but pay the seller's bills within the prescribed discount period. This practice is usually regulated by the purchasing department when the order is placed or at the time the bills are received and checked for prices. Railroads usually pay the freight on destination bills and if the terms call for discount after freight charges, the freight is deducted from the bill and the cash discount taken. If the freight bill is not available, the freight is estimated and correction made later.

Profit in Understanding Terms

Quotations are made in a variety of ways and the seller should see to it that the quotations clearly state the terms offered. If the goods are sold on a destination basis, the terms should state whether the discount is to be taken on the full amount of the invoice or the net after deducting the freight, and whether the cash discount period runs from the arrival of material or from the date of the shipment or of invoice. The buyer should realize that on a destination basis the material is not his property until it is received. If the goods

are sold on a mill or shipping point basis with the freight allowed, the freight should be deducted from the invoice and the cash discount taken. In this case, the material is the property of the buyer from the date of the shipment and the bills will usually be rendered 10 days from the date of the shipment or of invoice. If the goods are sold on a straight mill basis, the terms are perfectly clear.

Where water-born lumber is purchased on the basis of delivery f. o. b. rails, the terms are usually net after water transportation charges are deducted, and the net amount of the invoice is paid after receiving the bill of lading showing that the lumber has been transferred from boat to cars. The usual terms on such shipments are net 30, 2 per cent in 10 days after deducting freight. Lumber by rail from mills to railroads is usually on an f. o. b. mill basis and the cash discount taken is based on the date of the invoice or the date of the shipment providing the invoice is supported by the inspector's certificate and the bill of lading. If the purchase is on a destination basis, the cash discount is taken usually within 10 days of the arrival date after the bill has been supported by the inspector's certificate. Instead of offering 2 per cent after deducting freight, some concerns prefer to offer 1 per cent on the face value of invoice thereby eliminating all reference to freight. Where the buyer has the option, he should take the 2 per cent as this is considerably in his favor. In cases where 10 days' discount period has passed before the receipt of an invoice or bill from the seller, the buyer is entitled to take the cash discount if paid promptly on its receipt. The bill cannot be paid before it is presented. Cash discounts on freight charges are taken when a seller makes a destination price and asks the buyer to pay the freight, although the terms say nothing relative to discount after deducting freight.

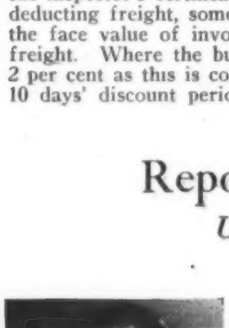
Railroads prefer to be quoted on an f. o. b. mill freight allowed, cash discount basis of purchase. This permits easy checking of prices and clarifies the situation by allowing the deduction of the freight from the face of the invoice and completes the transaction with the buyer who pays the freight and secures his proportion of freight earnings provided the seller bills through to destination.

Most railroads take cash discount 10 days after the receipt of invoices in their offices and no objection is offered by the seller as this is only two or three days beyond the cash discount period. The majority of railroads, having cash on hand, discount their bills carrying 1 per cent or over, although some take advantage of a discount as low as ½ of 1 per cent. The cash discounting of bills regulates the flow of bills, makes the clerical work involved more uniform and eliminates the crowding of such work either at end of month when bills are paid, or twice a month as is the case with some railroads. Sellers should exercise more care in the terms quoted and accepted.

This paper was accepted without discussion.

Report of the Committee on Forest Products

Uniform grade marking of lumber endorsed—Also the reduction of car lumber sizes



Gene Hanner

Paul McKay
Chairman

Every railroad should use tie branding hammers, using a tool that will show the size or grade of the tie, the inspector's number or symbol and the name of the road. To insure against duplications of design, or to avoid similarity in brands, each railroad should file with the American Railway Association the symbols used in branding.

The standarization of specifications for hickory handles is desirable from a purchasing standpoint, but the standardized specifications should have the approval of the Mechanical and Engineering divisions and it is recommended that contracts be established with those divisions looking toward the early adoption of standard specifications for hickory handles. It is also recommended that hickory handles should be stored in a cool, dry place, which is not exposed to excessive heat or light.

Grade Marking a Forward Step

One result of the adoption of American Lumber Standards has been the practice of grade marking lumber. A concerted effort is being made by lumber associations for the adoption of standard symbols, to designate the grade of lumber produced by each individual member of such association. This is a forward step but the committee does not recommend that railroads agree to accept lumber on the basis of grade markings. The right should be reserved to inspect the lumber purchased. The practice of grade marking may prove a saving to railroad lumber inspection forces, for the reason that stock offered for inspection and acceptance by railroad inspectors must be graded by the sellers before being offered and should result in the discontinuance of the present practice of their offering mill-run stock.

Specifications for Lumber

Another practice which may result in large savings to railroads is the specifying of the grades best suited for each use. As yet, no American Lumber Standards have been adopted for car lumber, although the Mechanical Division is now preparing standards for sizes and grades of car lumber and it is expected that the Mechanical Division will soon issue its report of recommended grades and sizes.

The West Coast Lumbermen's Association is now engaged in revising its rules and it is expected that within the near future, new rules will be issued by that association, conforming to the requirements of the railroads, which are, as a group, the largest users of lumber from the Pacific Northwest.

The Mechanical Division at its annual meeting in 1926, recommended that for closed cars, the siding or sheating, lining

Stores of Switch Ties and Telegraph Poles on the Northern Pacific at Tacoma, Wash.

and roofing should have a moisture content of not more than 10 per cent, and the moisture in decking for house cars should not exceed 12 per cent. At the annual meeting of the same division in 1928, alternate standards were adopted for a period of one year beginning March 1, 1929. The alternate patterns are, in most cases, narrower than the 1910 M. C. B. patterns, and the Purchases and Stores Division was requested to obtain comparative prices of the 1910 M. C. B. and the 1928 A. R. A. alternate patterns, specifying the same grade and moisture content in each case.

Should Standardize Sizes

Until the Mechanical Division issues a recommended list of grades and sizes for car lumber, there is ample opportunity for the Purchases and Stores Division, working in conjunction with Mechanical Division, to eliminate obsolete sizes and reduce materially the number of currently used sizes of car lumber. One of the southern railways has recently issued a list of standard pine lumber sizes, for freight cars. This list contains 62 sizes, a decrease from the former list of 142 stock sizes, or a reduction in stock items of freight car pine lumber of more than 56 per cent. An eastern railroad has reduced its stock items of car sills to 7 sizes, and its stock items of car framings to 19 sizes.

Control of Crosstie Stocks

A western road has recently intrusted the responsibility of distribution of crossties to the stores department. This department has adopted forms for reporting daily, weekly and monthly conditions of stock on hand at treating plants and on the line, enabling the stores department to control the stock investment and the supply on the line. Savings have been effected by the supply train distribution of ties along the right-of-way.

Ties on practically all railroads are supplied by the purchasing department, while the distribution, in most cases, is under the supervision of the engineering department. In arriving at conclusions in the crosstie situation there are many angles to be considered, such as climatic conditions, requirements, equipment, direction or density of traffic and empty car movements.

Forest products to be supplied treated, should be procured far enough in advance to permit thorough seasoning in order to insure proper treatment. The resulting carrying charges and increased stock balance must be expected as one of the prerequisits to the plan of supplying treated products promptly, thus avoiding unsuitable and costly substitutions arising from the use of untreated lumber where decay is the primary cause of failure.

The report was signed by: Paul McKay (chairman), assistant purchasing agent, N. P.; C. S. Burt, superintendent ties and treatment, I. C.; H. O. Bush, general lumber and tie inspector, Arie; T. H. Clarke, tie and timber agent, Sou.; D. R. Elmore, assistant to general manager, F. G. E.; John Foley, assistant purchasing agent, Penna.; J. E. McNelley, chief tie and lumber supervisor, A. C. L.; A. J. Neault, assistant to general purchasing agent, C. & N. W.; C. C. Warne, first assistant purchasing agent, N. Y. C.; F. V. Weisenburger, timber agent, N. P.; M. E. Towner (chairman ex-officio, general purchasing agent, W. M.

O. Nelson (U. P.): Would it not be advantageous if they would add a date to the tie branding hammers using the last two numbers of the year?

Paul McKay (N. P.): That might be done but to add the year will make it a rather large die or brand.

J. H. McGoff (A. T. & S. F.): What kind of hammer would you have to show five or six grades of ties?

Mr. McKay: You could carry two hammers, you would have two different numbers on each head or you might have a hammer with interchangeable heads. A hammer with those dies would weigh perhaps three or four pounds. While it isn't so essential to use it on sawn ties it would be beneficial for hewn ties. It is usually easier to tell from a casual inspection of the end of the sawn tie what grade it is than by looking at the end of a hewn tie. The purpose of hammering the hewn tie by grades is to determine the size of the tie. 2,500 or 3,000 ties is quite a number to brand in a day but I think an inspector can perform that work without difficulty.

C. S. Burt (I. C.): I thought the idea was to have one or two hammers and hit a number three tie three times, a number four tie, four times and so forth. That is the practice on most of the roads that use similar hammers.

W. W. Griswold (W. & L. E.): We follow the practice mentioned by Mr. Burt in branding our ties. We use one hammer with a circular die on one end and an octagon die on the other The inspector's number is in one end as well as the initials of the road. On the other end there is the hexagon die with the same number and the initials of the road. We determine the grade of the tie by the number of marks in the end. The weight of the hammer is about two pounds. One inspector has taken up from 900 to 1,000 ties a day.

Paul McKay: I want to leave one thought in connection with the use of alternate patterns of lumber. The alternate patterns for siding provides for a finished thickness of 13/16 in. If that is changed to 25/32 in. the railroads buying that siding can save $1.50 to $2.00 per thousand feet.

The report was adopted without further discussion.

Report On Scrap Handling and Reclamation

New ways of saving waste discussed—Urge heavier car loading—Motion pictures shown

E. J. Becker
Chairman

The possibility of effecting economy in reclamation is generally recognized by all railroads. The importance of this subject justifies a constant and careful study of practices as well as the inception of new practices. However, local conditions, distances from the market, etc., are vital factors in determining the extent to which reclamation may be carried on profitably. What effects economy in a reclamation operation of a particular commodity on one railroad may not on another. The importance of accurately determining the costs on all scrap handling and reclamation operations are strongly emphasized.

A study was made of the efficiency of car loading in the handling of scrap, both to and from the scrap docks and reclamation plants. It is believed that the supply trains are most efficient for shipping scrap to the scrap plants, these trains not only cleaning up scrap over the railroad at regular intervals, but also permitting capacity loading and avoiding delays to cars. The importance of loading all cars to capacity is emphasized.

Co-operate with Shop Forces

A Joint Committee on Reclamation was appointed in 1927, consisting of a sub-committee appointed from the members of this committee of Division VI to act in conjunction with a committee appointed by Division V, Mechanical. During the past year this committee prepared a questionnaire covering 16 major reclaimable items of car materials used in interchange, which was submitted to mechanical officers of 102 Class I railroads and replies were received from 101 of these roads. As a result of this questionnaire, it was considered advisable that this committee serve indefinitely until rules and regulations for reclaiming are agreed upon.

New Reclamation Methods

New reclamation practices coming to attention of the com-

Scrap Sorting Bin on the Rock Island at Silvis, Ill.

mittee on scrap reclamation during the year are as follows:

Switch points having 16½-ft. points are cut to a shorter length for yard use. Switch slide plates risers are upset in "bulldozer" to the original height.

Reforming and retempering rail joint springs.

Track wrenches are made into wrecking bars when the jaw is broken.

Superheater units are cut to make straight flues, and the old units welded together.

Spring planks are made from old channel iron or channels. Brake beams, repair facilities include a testing machine.

Journal bearing wedges are reground to contour.

Blower valves are reseated and blowoff cocks reseated.

Crank case oil is reclaimed with special equipment.

Steam hose head gibs are welded and dressed with emery wheel and air hose couplings that leak between the gasket groove and gasket are repaired by slightly closing in the groove by pressure.

Coal picks are made from worn and broken coupler knuckle pins, using an oil furnace, forging machine, and power hammer.

One railroad has effected considerable savings in the reforming of angle bars.

Salvage Crank Case Oil

The contamination and dilution of gasoline-engine crank case oils by partly burned fuel results in waste and expense. Methods permitting the more frequent changing of oil without an increase in lubrication costs have long been needed. Reclamation of the used oil has been attempted in various ways with indifferent success for some time. Filtration has been tried as the simplest method. This is difficult, however, as any filter fine enough to remove more than the coarser dirt quickly becomes clogged, and it does not remove acids.

The cost of reclaiming with chemicals is low so that the reclaimed oil is available for use at a fraction of the cost of new oil. The saving not only allows more frequent changes of oil with resultant decreases in maintenance costs, but enables the user to purchase the highest grade oil at lower ultimate costs.

One railroad reports operations as follows for a four months' period:

	Gals. Recovered	Labor	Light and Power	Material	Cost Per Gal.
November	1,008	$26.40	$38.40	$60.68	.124
December	952	28.80	40.92	45.06	.1208
January	996	30.00	31.00	52.90	.1143
February	911	24.00	35.84	38.73	.1081
	3,867	$109.20	$146.16	$197.37	.1170

This method of reclaiming crank case drainings has now been in use about a year and the reclaimed oil has been used exclusively in the operation of a number of gas-electric rail cars during that time with apparently as good results as with new oil.

Investigation develops that some roads are reclaiming journal compound at a cost of $.022 per lb. The only practical method in use appears to be that of cutting off the charred portions of the grease with a knife and pressing the remainder through a fine mesh perforated plate and reforming it into cakes. At some points the charred portions of the grease are boiled and the product used on center plates and hub liners and for skid grease.

The Sale of Scrap

The committee emphasizes the importance of all railroads using the revised scrap classification adopted at the 1927 annual meeting. This classification was prepared in conjunction with representatives from the U. S. Department of Commerce, the Scrap Dealers Association, etc., and should be generally accepted. A canvass made of 57 of the leading railroads of the country indicated that 30 were using the revised classification.

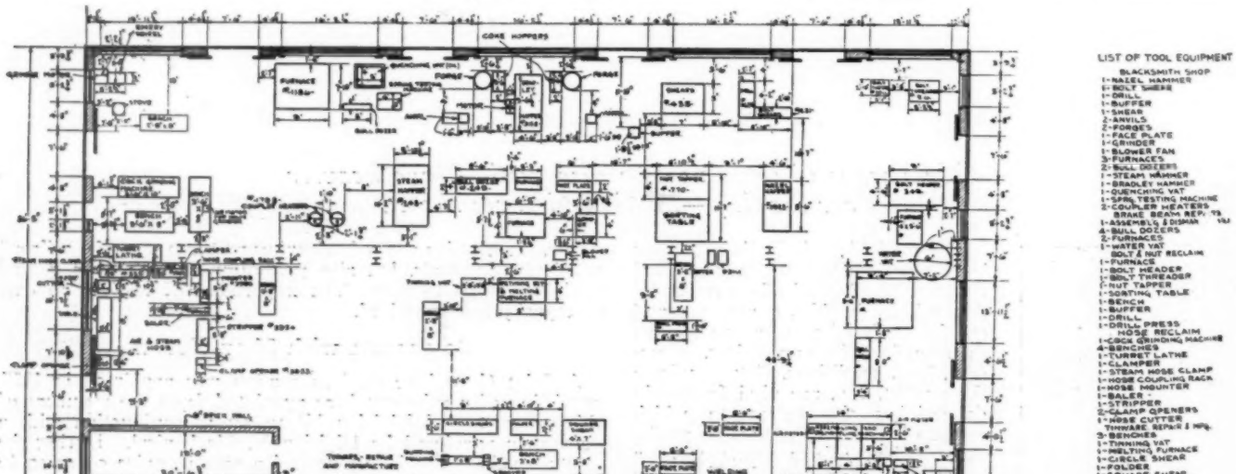
A review of the classification for non-ferrous metals indicates that the existing classifications cover their respective groupings as well as can be done, considering the different conditions existing on various roads.

The following additional classifications are recommended:

50-A—Grindings, brass and bronze
50-B—Brass foundry ashes
50-C—Foundry skimmings—brass and bronze
77 —Graphite crucibles—worn out

Scrap Rubber Valuable

The demand for scrap rubber has grown rapidly, due to the removal of certain restrictions as to its use by manufacturers



Tool Arrangement at a Reclamation Plant

of rubber goods. All roads should establish sales contracts directly with the large rubber manufacturing companies, as well as with jobbers and dealers, to establish the best methods of preparation, classification and disposal of this class of material.

The report was signed by: E. J. Becker (chairman), traveling storekeeper, S. P.; I. C. Bon, superintendent of reclamation, Wab.; T. S. Edgell, division storekeeper, M. & O.; Chas. Galbraith, purchasing dept., O. S. L.; J. S. Genther, general storekeeper, L. & N. E.; P. L. Grammer, assistant purchasing agent, Penna.; T. J. Hegeman, superintendent of reclamation, C. B. & Q.; Howard Kitchen, superintendent of reclamation, N. P.; J. C. Kirk, assistant general storekeeper, C., R. I. & P.; C. N. Lammers, supervisor of reclamation, C. & E. I.; L. J. Leysaht, superintendent of reclamation, St. L.-S. F.; G. W. Lieber, superintendent of reclamation, M-K-T.; C. A. Malone, purchasing department, A. T. & S. F.; A. L. Prentice, supervisor of scrap and reclamation, N. Y. C.; W. P. Stewart, supervisor of scrap, I. C.; C. B. Tobey (chairman ex-off.), general storekeeper, L. V.

Discussion

A. S. Thompson (Columbus & Greenville): What effort is being made to weld and build up Manganese frogs?

T. J. Hegeman (C. B. & Q): We have been reclaiming Manganese frogs for the past two years and have reclaimed frogs in the track that long that are standing up as well as new frogs. It is quite a trick, however, to reclaim them.

Mr. Thompson: What results do you get from Manganese welding?

Mr. Hegeman: We reverse the polarity. You have to reverse the polarity to get the weld. We use about 64 amperes of current. We use a coated Manganese rod. We have made a complete weld in one instance. We had a frog in service for eight months and the casting broke entirely in two at least three feet from where we welded it. The frog was examined by our maintenance engineers and they decided that the break was in the previous welding and had nothing to do with the new fracture. We welded that completely and the frog has been in the track now for over a year. We grind until we get a bright surface. We use a medium carborundum wheel for grinding.

R. J. Bussell (C. & O.): Do you use reclaimed frogs in the main line?

Mr. Hegeman: Yes, both Manganese and other spring frogs. They are used in fast traffic line with good results.

J. C. Kirk (C. R. I. & P.): We don't reform angle bars in our own shop but we have been reforming angle bars at the Mississippi Valley Steel Company's plant in St. Louis and at the McKenna Company in Joliet for about two years with very good results.

D. R. Elmore (F. G. E.): Has the Committee investigated the desirability of a separate classification for hair felt. It is valuable and roads that are repairing will find it economical to sell it. It is worth $80 to $100 a ton.

A. L. Prentice (N. Y. C.): We have designed a machine for regrinding journal bearing wedges. We take a wedge on which we have a flat spot and the machine grinds the direct radius of 6 ft. 6 in. We get from five to six regrindings of these worn wedges. The output of our machine is from 40 to 45 wedges a day. Our savings average about 40 cents a wedge through the use of this grinding machine.

The report was accepted without further discussion, following which three reels of moving pictures were shown of reclamation operations on the St. Louis-San Francisco.

Report on Supply Buildings and Facilities

Exchange of new store house plans recommended—Independent locations will save handling expenses

The belief has become general among all members of this Division that the time has arrived to make definite recommendations which will enable railways to construct their buildings and facilities in accordance with standards common to all.

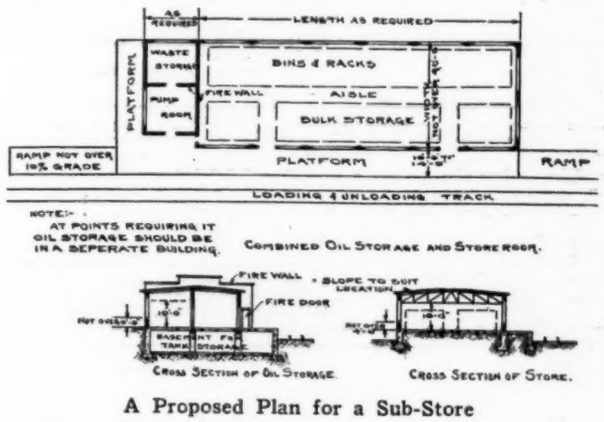
The committee recommends that a suitable loose-leaf binder be prepared containing prints and photographs covering buildings and facilities. The committee also recommends that beginning with the year 1928, when any railway belonging to the association constructs new buildings or facilities, prints and photographs should be forwarded to the secretary to be held for the consideration and information of the committee, and that prints and photographs selected and approved by the Division be reproduced by the secretary and forwarded to the chief supply officer of the member railways for inclusion in their binders.

Store Houses

All stores buildings should be located on exclusive loading and unloading tracks which allow the free movement of cars and which are easily accessible from main switching tracks; and all buildings should be located to reduce switching operations. General store houses should not exceed 100 ft. in width, division store houses should not exceed 60 ft. in width, and substore houses should not exceed 40 ft. in width; and all store houses should be in multiples of 18 ft, 20 ft. and 22-ft. bays, according to the material used in construction.

All store houses should be built of fire-resisting materials and located centrally if possible; otherwise, near the point where the larger part of the material is to be used or distributed. They should be built at car-floor level without basements and should not exceed one story. The height of the ceilings under roof trusses or floor beams should not exceed 10 ft. They should be built with factory-type windows equipped with pivoted sash, with the windows not less than 3 ft. nor more than 4 ft. from the floor. The doors should be 8 ft. in height and not less than 6 ft. nor more than 10 ft. in width with small passage doors provided in the material doors. The widths of the main aisles should be the same as the material doors. All store houses should have unloading and shipping platforms not less than 10 ft. nor more than 14 ft. in width. They should extend the full length and width of buildings on sides and ends. All platforms, whether long or short, should have ramps at the ends.

General store houses exceeding 60 ft. in width should be built with a single row of columns in the center and arranged



A Proposed Plan for a Sub-Store

for two longitudinal aisles with the bulk storage in the center and the shelves and racks on the sides. General store houses 60 ft. or less in width should be built with roof trusses spanning the entire width of the buildings and arranged for one longitudinal aisle, the aisles should not be less than 30 in. nor more than 36 in. wide between the shelves or racks and the side and end walls of all store house buildings.

Paint and Oil Houses

Where the volume of business justifies, paints and oils should be kept in one building; and the buildings should be located not less than 50 ft. from the store houses and on the same tracks. These buildings should be built of fire-resisting materials at car-floor level, and should be built in six units as follows: two in the basement for tank storage only, one for the storage of paint and one for the storage of oil; and four units on car floor level, one to be used as a pump and delivery room, one for the storage of waste, one for the storage of paint, and one for mixing paint.

The height of the ceiling in the units on the car-floor level should be 10 ft. under the roof trusses. Modified factory-type windows equipped with pivoted sash, wire-inserted glass and fusible links, not less than four feet from floors should be installed on the car floor, and all the material doors should be 8 ft. in height and not less than 6 ft. nor more than 10 ft. in width, each door containing a small passage door. Covered end platforms, with ramps at one end, and equipped with barrel stackers should be provided for handling and storing of both full and empty barrels of oils, paints, greases, etc.

Buildings for inflammables should be located on the same tracks as store houses, but at a safe distance from other buildings. They should be built of incombustible materials, and adequately ventilated overhead and underneath. No artificial heating or lighting should be installed.

Lumber Storage

Lumber sheds should be single-storied and no higher than will permit the stacking of lumber to the highest point reached safely from the floor of a car. Overhanging roofs should extend over the edge of cars to protect unloading. The sheds should be located on the same side of the wood mills as the lumber yards.

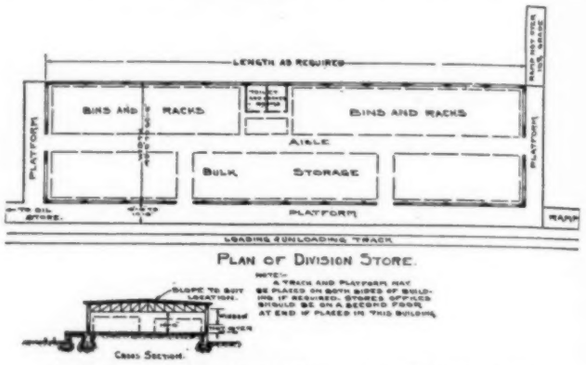
Gas Houses

Buildings for oxygen and acetylene should be constructed of fire-resisting materials with light roofs. They should be adequately ventilated and placed 50 ft. from any buildings. They should be located on the same switch track with store houses and be built at car-floor level and the platforms should not be less than 8 ft. wide, with ramps at each end. Oxygen units should be twice as large as acetylene units and separated by fire-resisting walls extending through the roofs.

Pave the Roads

Arterial roadways and their principal branches should be paved and 16 ft. wide. Tractor and trailer roadways should be paved and not less than 6 ft. nor more than 10 ft. wide.

Store house shelving should be either of the skeleton or open type construction, and built of either wood or steel not more than 84 in. high nor more than 36 in. wide in order to conserve floor space. They should be without offsets and arranged in cross-sectional rows not more than 3 ft. apart where trailers are not used. Storage sheds of corrugated iron and steel construction have been found satisfactory for the storage of certain classes of material.

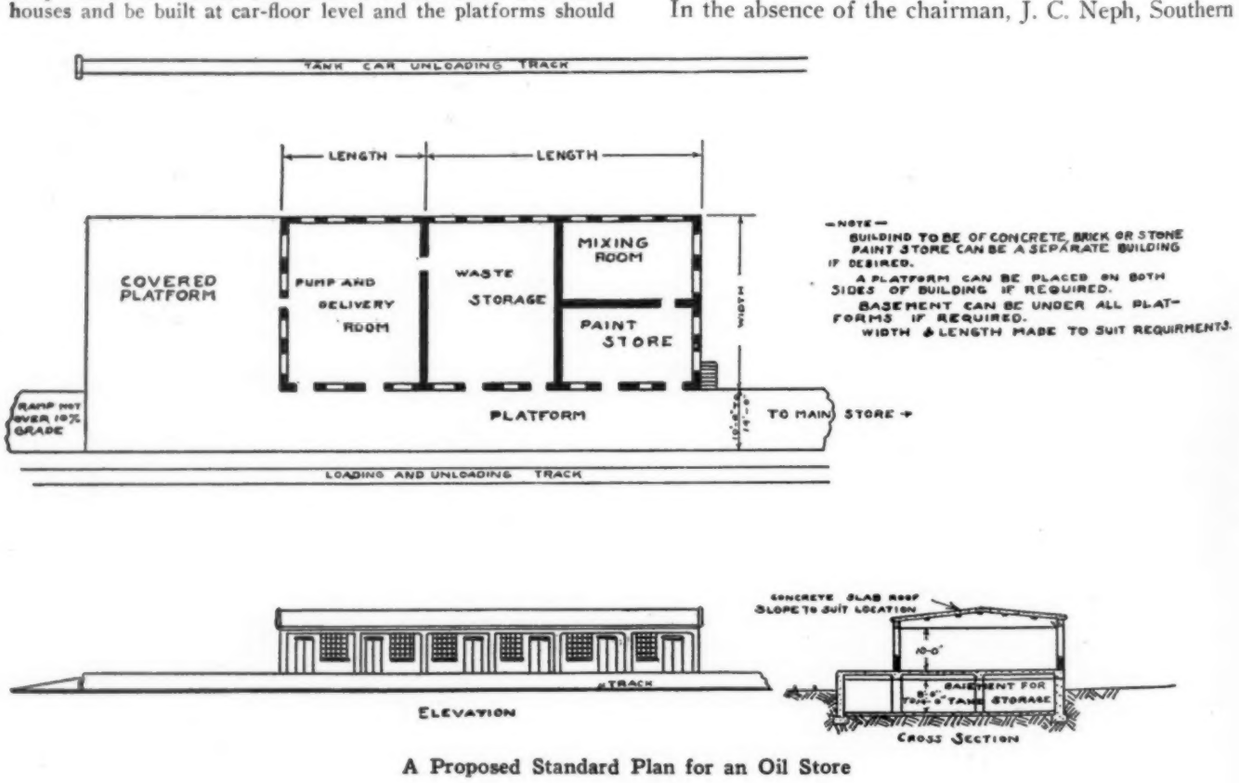


A Proposed Standard Plan of a Division Store

The report was signed by A. B. Lackey (chairman), division storekeeper, Sou.; G. T. Dunn, stores inspector, Wab.; I. G. Morrison, storekeeper, C. B. & Q.; G. W. Leary, foreman, C. & O.; A. M. Lemay, division storekeeper, C. M. St. P. & P.; J. J. McKinnon, storekeeper, B. & M.; J. C. Neph, general inspector of stores, Sou.; C. E. Smith, general material supervisor, Penna.; J. L. Sullivan, general traveling storekeeper, U. P.; H. O. Wolfe, general storekeeper, C. & A.; L. C. Thomson, (chairman ex-officio), manager of stores, Can. N.

Discussion

In the absence of the chairman, J. C. Neph, Southern



A Proposed Standard Plan for an Oil Store

Pacific, presented the report on buildings and facilities.

O. Nelson (U. P.): It has been recommended that the aisles should be limited to 30 in. and not more than 36 in. in width. Many railroads are adopting the lift tray system of handling material. These lift platforms are at least 33 in. wide. We should change the size of those aisles to not less than 36 in.

J. E. Mahaney (C. & O.); Nothing less than 42 in. should be considered for aisles for general storehouses. You are not going to have room to operate your trucks or your trailers through your general aisles and into your sub-aisles with less than 42 in.

Mr. Nelson: A basement is a desirable facility in a storehouse. Without it we have to erect outdoor platforms for storing some of the heavier materials. In putting in foundations it is necessary to go quite deep and the basement can be built with little added expense.

A. C. Johnson (Nor. Pac.): The basement is a very efficient arrangement. With a basement and a second story you can operate from the center floor.

Chairman Kyle: The basement gives unlimited loading capacity.

Mr. Neph: We thought that material could be handled on one floor if the space were available, cheaper than by going up or down. The Wabash has recently completed a store 100 ft. wide by 850 or 900 ft. long, all on one floor, and claims considerable economy in the handling of material on the one floor.

Mr. Mahaney: It costs more money to put material in the basement or on the second floor than it does to put it on the first floor. Modern freight houses are all on one floor because of the facility of handling the material.

L. C. Thomson (C. N. R.): Local conditions determine whether to build a basement. The ideal condition is one floor to save cost of handling. We are forced to the basement on many occasions by the fact that we can't expand on the ground floor.

W. Davidson (I. C.): This committee should be instructed to designate in its report that ground floor level is preferable where conditions will not permit space for basements.

Mr. Nelson (U. P.): We all have large quantities of extra heavy material. If we try to store that sort of material on the first floor we have to construct a mighty strong floor.

D. R. Elmore (F. G. E.): Has the committee considered the desirability of closing in the sides of the lumber sheds for the storage of kiln dry lumber.

Mr. Neph: This lumber shed mentioned is for the protection of siding decking and all kinds of dry lumber. We don't consider it necessary to enclose such buildings. You increase the cost of handling by doing so.

Mr. Elmore: Under the new American Railway Association specifications limiting the moisture content to 10 per cent, we found it desirable to enclose our lumber sheds. Otherwise the lumber is likely to get wet from blowing rain and snow.

Chairman Kyle: The design of the lumber shed for kiln dried lumber is governed by the locality. Facilities which are necessary on the east end of the Northern Pacific are not necessary on the west end of the road.

C. S. Burt (I. C.): The report contains nothing about the possible use of treated material for these buildings. There may be several places around the storehouses and the shops where treated material, could be used to advantage. I don't necessarily mean creosoted material, but possibly the use of material treated with some of the salt solutions, which might be more fire resistant than material treated with creosote.

D. C. Curtis (C. M. St. P. & P.): The location of the storehouse is very important. With modern material and handling facilities the location is important, because 10 miles count with the tractor just as much as they do by hand. A great deal of thought and planning should be given to insure that the storehouse is properly located. The lumber shed is worthy of careful study. Mechanical engineers are more and more insisting on a lower moisture content. Some of them specify as low as six per cent. If you are going to keep the moisture down to six per cent, you must have a very efficient drying shed and we might just as well prepare to meet it.

The report was then adopted.

Report on Materials Made In Shops

Railroad manufacturing practices challenged where accurate and complete cost data are lacking

Moffett

J. T. Kelly
Chairman

Methods of controlling shop manufactured articles were investigated by the committee, taking into consideration the surplus at outlying points. It is recommended that a store order should be given the same consideration as a purchase order. A copy of every store order covering the manufacture of stock items should be sent promptly to the general storekeeper's office to be checked against the master stock book, to insure that there is no surplus at any other point.

Where a cost comparison is made, all the costs used by manufacturers should be taken into consideration. However, the decision to discontinue shop-made material should not be based entirely on such comparisons because a great portion of the fixed expenses will not be reduced or increased whether this material is made in the shops or not. This applies only where such manufacturing is incidental to locomotive and car repairs. Where there is a separate organization and buildings for the specific purpose of manufacturing material, cost comparisons are necessary. Records should be maintained, reflecting the actual saving or loss as compared to the cost if purchased.

In making comparisons, the cost of groups or kinds of material should be developed. In the production of grey iron, steel or brass castings, the total foundry output or tonnage may be less per pound than the same tonnage if purchased in the open market, but the segregated cost should be known. The cost of locomotive cylinders and similar equipment should not be merged with the cost of manufacturing small items such as queen posts and door shoes and guides, nor should driving box brasses and eccentric lines hubs be merged with washout plugs and miscellaneous small brass castings. If the shop foundry is producing brake shoes, these should be treated as a separate item. The price for scrap metals used in manufacture should be based on market conditions or existing exchange contract figures, with an allowance for the difference in handling costs. It is recommended that checks be made constantly on purchased articles to protect against exorbitant prices.

Items of Cost to Consider

The various items of expense chargeable to the cost of manufacturing material in company shops are grouped and considered under the following heads:

Material: The cost of all material used should be included.

Labor: The cost of all labor used in manufacturing the articles covered by the store order, or in handling the raw material in process of manufacture, should be included.

Material Store Expense: The usual percentage of the value of material, on account of store expense, should be included. This percentage may be determined as prescribed in the I. C. C. Classification of Operating Revenues and Expenses of Steam Roads.

Shop Expense: The customary percentage of the cost of labor employed should be included. This percentage shall be determined as prescribed in I. C. C. Classification of Operating Revenues and Expenses of Steam Roads.

Depreciation: A charge shall be made to cover depreciation of buildings, machinery, equipment and office equipment for the time they are used in the manufacture of the material. The charge should be based upon the percentage of the original cost determined to be equitable from the carrier's experience, and the best information as to the average loss from depreciation of similar buildings, machinery and office equipment. A charge under this heading shall also be made for the depreciation of raw stocks of material should there be any loss.

Insurance: A charge shall be made to cover insurance on buildings, or portions of buildings, machinery and office equipment used and on raw material in stock and while in process of manufacture. This charge should be based on the policy of the carrier as to the percentage of value to be covered by insurance and also on the insurance rates as paid by the carrier.

Interest: Interest at the rate paid by the railroad on investment in land, buildings, machinery, office equipment, raw material in stock and in process should be included for the time material is in stock and in process of manufacture and the time the facilities are used in storing raw material, and manufacturing. If only a portion of a building is used, the value of the land and building should be prorated according to the number of square feet of floor space used for the different operations and interest chargeable to shop manufacturing costs shall be computed on this basis. The interest rate will only be applicable for the time the facilities are actually employed in the work covered by the store orders, plus a fair proportion of the non-productive time. The non-productive time should be apportioned according to the volume of work done on the various shop orders with the same facilities.

Taxes: A charge for taxes on investment in land buildings, machinery and office equipment and raw material in stock and in process of manufacture should be included. This should be based on the assessed value of the facilities and material in stock and in process, and the tax rate in the state in which the manufacturing shop is located. If only a portion of a building is used the taxes shall be pro rated according to the number of square feet of floor space employed. As taxes are assessed on a yearly basis, only a portion of the rate will be applied and that portion should be determined by the number of days the facilities are used in storing and producing the material being investigated plus a fair proportion of the time the facilities are non-productive. The non-productive time may be apportioned according to the volume of work done on various shop orders with the same facilities.

Maintenance: A charge for the maintenance of buildings used in storing raw material and in manufacturing should be included. This charge should be determined in the following manner: Divide the average annual charge to operating expense account "No. 235—Shops and Enginehouses," for the five preceding years by the average value of the investment as carried in valuation account "No. 20—Shops and Enginehouses" for the same period. Multiply the resulting percentages by the value of the buildings used and include the amount under the above heading. If only a portion of a building is used in the storing or manufacturing operation the value shall be apportioned on the number of square feet of floor space employed, and the calculation made on that basis.

A charge for maintenance of machinery should be determined by dividing the average amount charged yearly to account "No. 302-Shop Machinery" for five years by the average value of the investment in shop machinery for the same period as carried in valuation account "No. 44—Shop Machinery," and by using this percentage as the basis for the charge against the machinery used in the manufacturing. These calculations will give average maintenance figures for a year and must be prorated according to the time the facilities were used in the operation under investigation plus a fair proportion of the nonproductive time.

Bonuses: If bonuses are given a proportion should be applied to the cost to manufacturing in shops. It is advisable to spread the charge over a period of time. The circumstances in connection with the granting of the bonuses must be taken into consideration and each bonus case handled on its merits.

Injuries: A charge should be made on account of injuries to persons. A percentage of the direct labor charged to the store order equal to the percentage that labor charged during the preceding year to account "No. 332—Injuries to Persons," bears to the total labor charges in maintenance of equipment accounts should be used in arriving at this charge.

Supervision, Clerical and Supplies: Where a separate organization is necessary to handle the manufacture of a commodity, the increased cost of supervision, clerical cost and office supplies should be charged to the shop cost of manufacture. If it is desired to include additional charges for supervision, a proportion of the charges to account "No. 301—Superintendence," equal to the percentage that labor charged to manufacturing bears to the total labor charges to maintenance of equipment accounts should be apportioned among the various store orders. The basis of distribution to various store orders should be the relative proportion which this amount bears to the total labor charged to shop orders.

The delivery date should be shown on all store orders forwarded to shops for the manufacturing of material or for repairs, as a further feature of control. If, for any reason, the delivery date cannot be met, the orders should be returned to the stores department with notations to that effect. The raw material should be checked immediately on issuing the order and no store order should be made on the shops until the raw material is provided. Careful inspection should be made of all material manufactured by the road to prevent losses and to insure the production of articles satisfactory for the purpose intended.

The report was signed by: J. T. Kelly (chairman), general storekeeper, C. M. St. P. & P.; O. V. Daniels, general storekeeper, Penna.; W. N. Endy, assistant to general storekeeper, Reading; W. B. Gordon, assistant general storekeeper, C. N.; W. L. Hunker, district storekeeper, C. R. I. & P.; J. U. King, general storekeeper, A. C. L.; J. K. McCann, general piece work inspector, C. B. & Q.; H. Shoemaker, storekeeper, B. & O.; H. Weindel, inspector of stores, U. P.; A. S. McKelligon, (chairman ex-officio), general storekeeper, S. P.

Discussion

A. S. McKelligon (So. Pac.): The paragraph relative to controlling shop manufactured material is intended to prevent manufacturing an article in another shop when you have some on hand or manufacturing in quantity at a central or some other shop. It is just as important not to do that as not to duplicate a purchase requisition.

L. F. Duvall (A. C. L.): It is recommended that store orders have the same consideration as purchase orders. If that idea is carried out, manufactured material can be properly controlled.

Mr. McKelligon: What course would you follow to prevent the manufacture of material in one place where you have it on hand in another place.

Mr. Duvall: Before we manufacture any material we investigate the points that have surplus material.

J. E. Mahaney (C. & O.): On our railroad a committee was assigned to work up the cost of producing material on a production basis. That committee worked about eight months. They framed a very elaborate report, going over store orders for a period of four years and they developed what they thought was the proper quantity of each item to be manufactured at a saving. That report was submitted to the supply department and it fell to my lot to disagree with them in every way, shape and form. They approached the problem from a mechanical basis. They developed that it was economical to make 1,000 studs of a certain size, whereas our average monthly consumption was about 16. We are not justified in making 1,000 studs to help out the mechanical department or any other department.

C. S. Jones (So. Pac.): In making the store orders for outside stores we send copies to the general store, which copies show the prices at outside stores and these orders are checked with the orders at the general store.

A. Schipper (So. Pac.): Many of the railroad shops don't have the best of equipment. When material is

being manufactured it is important that this material be carefully inspected before it is placed on the shelves, so that after the material leaves the store no further work on it will be necessary.

J. G. Stuart (C. B. & Q.): Mr. Kelly spoke of the mechanical department or the car department wanting to manufacture something. I don't think we should recognize that. They have no business to manufacture anything. If the store department can't furnish what they need, it is up to the store department to get it, either by manufacture or purchase. We should endeavor, if possible, to penalize any one manufacturing material without a proper order from the store, exactly the same as we would one going out and purchasing material without getting a proper order through the purchasing and stores department. In manufacturing material in our own shops there are two separate measures to consider. The Interstate Commerce Commission has ruled that we cannot include certain items in our costs. When we have a manufacturing shop we have a right to charge out only the labor and the material and the immediate overhead, but when we manufacture in the shop in competition with outside manufacturers we must know what it is actually going to cost us. We ought to include in the price, insurance, taxation and depreciation. Let's make sure that every item that is manufactured in the shop is treated exactly the same as every item that is purchased.

Report On the Control of Supplies

Budgetary methods based on money value strongly favored, also pricing of orders

Sid Whiting

L. P. Krampf
Chairman

The committee has recognized the opposition to store budgets but feels that perhaps this has been, in a measure, due to a misunderstanding of the recommendations in previous years. Being desirous of obtaining an expression of opinion on the subject, the committee sent a questionnaire to supply department officers of Class I railroads, and the responses therefrom are outlined herein:

Number of questionnaires	30
Replies received	24
Favorable to the budget plan	12
Opposed to the budget plan	6
Number indicating no objection	6
Budget plan now in effect	9
Budget plan not in effect	15

The replies indicate that shop schedules or monthly appropriation allowances are in general use.

The committee recognizes that the basic principle for control of material and supply requirements is the stock book, and moreover, that units must continue to be the basis of ordering as reflected by the stock book records.

However, any other agency or plan, modified by past experience, that will be helpful to the control of material stocks merits consideration and the fact that an estimated value of purchases of materials required has been tried and found helpful by some railroads, should give such a plan substantial support and encourage its future development. Material stocks with their resultant investment in material over such a wide range of territory offer an important problem. All the information that can be made available is needed to avoid unnecessary carrying expense.

The committee submitted a chart outline expressed in money value, as an aid to the stock book record which will serve as a contributing factor to the control of material and supply requirements. The chart was shown as information only.

A consolidated chart based on past performance, expressed in money values with the amount of purchases posted daily in accumulated totals will be an additional agency to minimize the possibility of accumulating an excess quantity of material units. The chart is a valuable aid in determining what classes of material may be safely withheld from purchase. The posting of the daily material values in accumulated totals will sometimes show that the total purchases to date for a certain class have exceeded the average monthly purchases and the chart offers an opportunity to investigate the reasons therefor, which otherwise may not be done if reliance is placed entirely upon units as a basis of ordering and without regards to money values.

Other essential factors in controlling stocks of material are as follows:

Control, to be thoroughly effective, must be vested in the supply department, closely co-ordinated with the using departments. The supply department is essentially a department of service. It has assumed the leadership in the care, ordering and disbursing of material, and likewise should assume the leadership in any plan which has for its fundamental purpose the conservation of investment in material stocks. Adequate facilities for the storage of materials are also important factors in the control of material requirements.

Pricing Material

The committee strongly recommends that requisitions be priced and the total money value of each unit be shown. The purpose of this plan is to bring to the attention of the approving officer the money value of the material to be purchased. Requisitions expressed in dollars as well as units will tend to interest all in the conservation of material.

Control of A. F. E. material is difficult since the basis for the quantity ordered cannot be fixed by past performance. The supply department must have the co-operation of the users of this material to determine whether any substitutions may be made that will utilize similar material on hand and prevent the purchase of additional material. The time of delivery of material required should coincide with the schedule of progress of the work involved to prevent material being delivered an unreasonable time in advance of actual requirements. The difficulty in controlling this class of material emphasizes the importance of close co-ordination between the supply department and the user and that the supply department be given such advance information that will enable it to confine purchases to actual requirements.

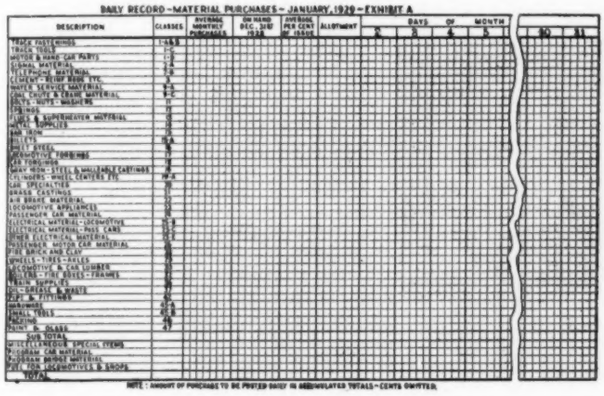

DAILY RECORD—MATERIAL PURCHASES—JANUARY, 1929—EXHIBIT A

Chart for Use with Stock Books in Controlling Supplies

The committee is a unit in its belief that effective control of material and supply requirement similar to the plan outlined in the report is being followed by many of our members and strongly recommends that careful consideration be given to this subject by all railroads. The committee further recommends that the Division assume a definite attitude with reference to this subject and either encourage its further development or definitely abandon the subject.

The report was signed by: L. P. Krampf (chairman), supply

agent, M. P.; B. A. Aikens, purchasing agent, M. C.; J. J. Bennett, purchasing agent, I. C.; S. L. Burton, section storekeeper, C. & O.; R. C. Harris, general storekeeper, Penna.; A. N. Laret, assistant to vice-president and chief purchasing officer. St. L.-S. F.; F. W. Mahi, general purchasing agent, S. P.; D. H. Reed, traveling storekeeper, Sou.; T. H. Ryan, assistant purchasing agent, Wab.; D. C. Curtis, (chairman ex-off.), chief purchasing officer, C. M. St. P. & P.

Discussion

D. C. Curtis (C. M. St. P. & P.): I disagree with the committee's report. We should base our orders on future requirements, not on past performances. Sometimes the only thing that we have to guide us is past performances, and we work on that basis, but that is not the ideal condition. There is absolutely no reason why an engineer cannot plan how many bridges he is going to repair. He should map out his work so that he knows the month and practically the week that he is going to do his work. In the same way mechanical officers should know what locomotives are going to go through the shops and should know whether they will require side sheets, new tires or driving box brasses. The report states that you cannot control A. F. E. material. If there is any material that can be put on an allotment basis, it is that.

L. P. Krampf (M. P.): The only guide for future requirements must be past performance. There is not a storekeeper present who can intelligently order material, unless he goes back to his stock books and ascertains what the requirements have been for the preccding month, three months or six months. Mr. Curtis, as I understand, takes his allotments and works them up from his storekeepers to the general storekeeper. The committee did not think this plan feasible. While we believe in an allotment plan, we think it better to maintain a chart or record of some kind showing the number class allotment and average consumption and the amounts of the requisitions to be posted daily with totals opposite each item. We do not intend to replace the stock book.

U. K. Hall (U. P.): On the Union Pacific we think that we have a pretty good store department organization. We can say that we are going to spend so much money for a certain class of material, but unfortunately we have not yet reached the place where we can boss the railroad. The chart shown is the most practical line-up to control stock investment that I have seen. Mr. Curtis said that we should be able to find out how much material will be used day by day. We get estimates but something goes wrong and we are left with the material on hand. We are for any allotment and means that will assist us in the control of material, but we must prepare to meet the needs irrespective of what they may be.

Report on the Training of Store Forces

Definite courses of instruction in supply work advocated in first survey of subject

G. A. Goerner
Chairman

Thirty-eight replies to questionnaires sent to purchasing agents, stores managers and general storekeepers on 31 railroads show that few roads have a definite program of educating or training their employees. Outstanding programs are the apprentice system and the stores school. Most roads hold monthly or weekly meetings, at which important subjects are discussed and operating rules explained. Some roads hold these meetings during, and some outside of regular working hours.

The need of training men in the stores department grows as the department expands. I' has developed into a department ot specialization. The number of items carried in the average store has increased. The scope of responsibility for the storekeeper has also increased. It is no longer confined to ordering and shipping material, or issuing it over the counter. The modern store department follows the material to the point of application. The work is no longer confined to the store houses and store facilities, but includes the operation of reclamation and timber preservation plants, quarries, saw mills and some manufacturing shops. The number of employees has increased with the added work and responsibilities and their training can no longer be the personal task of the supervisor.

Selection of Employees

The building of an organization starts with the careful selection of employees. The wise supervisor will endeavor to get the best men possible into the organization even in the lowest paying positions, for the laborer of today may be the stockman or foreman of tomorrow.

A file of applications should be kept of all likely prospects, high school graduates being preferred. Where a special application form is used it should be filled out and kept on file. From these applicants the men should be selected, and only men physically fit should be engaged.

Vacancies in the purchasing department should be filled by experienced stores employees. This will provide men who have a knowledge of material and its use and a general knowledge of the methods of the material using departments.

Training for Purchasing

Periodical meetings of purchasing department employees should be held at which live subjects or particular commodities are discussed. It is also considered of value to have the employees study the material at stores, shops and manufacturing plants and make reports at these meetings. The use of text books and magazines should be used to familiarize these employees with up-to-date methods. Emphasis should be placed upon the value of visits to the purchasing departments of other railroads.

Stores Apprentices Favored

For educating and training employees in the stores department, the committee recommends the apprentice system, training schools and periodical meetings. The apprentice system should require a four-year training course to allow sufficient time to study all phases of stores work. It is preferable to educate the apprentice at general or large stores where a broader knowledge can be acquired. The apprentice should not replace another employee but should be an addition to the regular force, permitting his training at any location or in any position.

The applicant should be examined to determine his general fitness, and should pass a physical examination. He should preferably be a high school graduate. The storekeeper should interview the parents or guardians, and, make certain that the applicant as well as his parents or guardians are willing to have him leave home if it is necessary to transfer him to another point. It is desirable to put the applicant on a six months' probation. Care should be taken not to engage too many apprentices. The number depends on the size of the department and the demand for men in the better paying positions. The ideal arrangement is to assure the apprentice a suitable position when his course is completed.

Scope of Apprentice Courses

The apprentice course should provide a thorough education in all phases of storekeeping both in the office and stock rooms. The apprentice should work at all the various positions in the

store, changing from one to another within a period of not more than three months. If it can be arranged, he should also receive at least six months' training in the purchasing department.

Every six months an examination should be given to determine whether the apprentice thoroughly understands the work covered and if successful with the examination, he should receive an increase in salary. When the four-year course has been completed he should be ready for promotion to some permanent position or be retained on a rate at least equal to the highest apprentice rate. On some roads having apprentice systems, no seniority rights are given until the apprentice course is completed. At that time seniority rights are retroactive and the committee recommends this practice.

Class Room Work Advocated

The apprentice system is limited to a select group and because of smaller salaries paid, it applies only to younger men. Employees who are already occupying better paying positions or because of other circumstances, cannot take the apprentice course, should be educated in classes.

Schools should be operated at large stores where there are a sufficient number of men requiring such training to make specialized courses profitable. Classes should not be so large that they handicap the instructor in giving the students individual attention, but at the same time they should be large enough to justify the time spent by the instructor.

Separate classes should be conducted in stockkeeping, accounting and other branches of storekeeping. The students should be selected for three classes with the idea of better fitting them for their present positions and preparing them for advancement. Class sessions, when possible, should be held during regular working hours, thus providing the school with a stronger organization and promoting greater interest. A two-hour session each week is proposed though a one-hour session bi-weekly is preferable to a longer period at less frequent intervals.

The stores school should follow a carefully planned curriculum. Practical illustrations, blackboard examples and sample problems should be solved and the classes should be given oral or written tests to determine their understanding of the work covered.

Weekly or monthly meetings of stores officers and employees should be held to discuss stores problems and explain existing instructions. Apprentices should be called in at all meetings of stockmen, supervisory men and all special meetings to give them the benefit of a broad experience and keep them posted on current matters.

The report was signed by: G. A. Goerner, (chairman), traveling storekeeper, C. B. & Q.; H. F. Burnett, general foreman, stores dept., K. C. S.; J. T. Goodloe, division storekeeper, Sou.; G. J. Hunter, traveling material supervisor, A. T. & S. F.; A. J. Kroha, assistant general storekeeper, C. M. St. P. & P.; H. M. Rainie, assistant purchasing agent, B. & M.; W. E. Rawson, district storekeeper, S. P.; L. C. Thomson, (chairman ex-officio), manager of stores, C. N.

Sample Questions on Stockkeeping

1. In general what are the stockmen's duties?
2. How does the stockman know when to make intermediate orders?
3. What is surplus?
4. How is surplus disposed of?
5. What is the use of Form 1901-C copy of purchase order?
6. When you get material on purchase order, how would you handle the receiving? Include the things which should be considered for proper check and the different steps of the transaction until it is finished for the stockman.
7. How is a freight charge cleared or charged off the stock report?
8. How does the stockman know when to change the description on the standard master key sheets in the stock book?
9. What is meant by substitution?
10. When and why should material hurry form be used?
11. What is the use of Form 2027 tally cards?
12. What is the object of unit piling material?
13. In taking inventory in stock book, which is the correct way, to follow the stock book, or to follow the stock of material?
14. How is the past 60-day usage figured?
15. What are the classifications of sheet copper?
16. When are blue tags used on material?
17. Name two commodities which must be stored in special places to prevent deterioration or damage.
18. What is meant by the term "working stock"?
19. If you were preparing a stock book for the following items, how would you arrange the items, i.e., alphabetically, numerically, etc.? Also show the classification of each commodity: Air brake material, oils, stoker material and square head machine bolts.
20. Why are the totals of columns 4 and 9 on the stock balance the same?

Discussion

M. E. Baile (M. P.): Did the committee consider roads that have agreements with the Brotherhood of Railway Clerks which organization includes employees in railroad stores department organizations?

Chairman Goerner: We recommend that no seniority rights be given in bidding in other positions until the apprentice course is completed, after which apprentices can exercise seniority rights which date back to the time of employment by the railroad company as a stores department apprentice.

C. J. Kirk (C. R. I. & P.): We have had an apprentice system in effect on the Rock Island for 17 years. Under our system, whereby these apprentices serve two years before graduation, we have never been bothered with step rates. We require apprentices to have at least a grade school and preferably those having a high school education.

L. C. Thomson (C. N. R.): While we have agreements with our employees, we have no difficulty because of that fact. If you will avoid enrolling too many apprentices and will also have an understanding with them that they have no privilege of bidding in positions until they have completed their apprenticeship, you will have no trouble.

J. G. Stuart (C. B. & Q.): While we have given a great deal of consideration to the apprentice plan, it has seemed better to us to have a real school which will give the men a more thorough understanding of the stores department.

O. A. Donagan (B. & M.): We inaugurated educational classes last Fall in which subjects are assigned to competent employees who prepare papers which are gone over by a committee, corrected if necessary and then presentd before meetings which are held twice each month. These papers are then open for discussion. At the end of the year some form of remuneration is given such as a trip over other roads for the purpose of observing different practices.

Mr. Thomson: I have been particularly impressed with the suggestion that vacancies in the purchasing department be filled by qualified men from the stores department. Years ago when I took a position as purchasing agent, I found to my dismay that none of the employes in the purchasing department from the chief clerk down had any real knowledge of the materials, for they had never come in contact with them. Purchasing agents years ago were too much inclined to be office men. Twenty-five per cent of a purchasing agent's time should be spent in visiting different manufacturing plants for this will enable him to buy materials more judiciously.

A Lift Truck Operation on the Missouri Pacific at Sedalia, Mo.

Report on Stationery and Printing

Reduction in sizes of forms will save money—
Centralized control recommended

E. J. Lamneck
Chairman

To secure the most economical results in printing forms, it is of importance that forms should be in sizes that can be cut, as far as practicable, from basic sheets without waste. While 8½ in. by 11 in. has been considered the basic standard, and is used by a number of lines, some roads are using 8 in. by 10½ in., with good results, and some have even reduced the basic standard to 7½ in. by 9½ in. By reducing the standard from 8½ in. by 11 in., to 8 in. by 10½ in., there is a saving of over 10 per cent in the paper used, and this is reflected in the price of the printed forms. By further reducing the size to 7½ in. by 9½ in. basis, the reduction in cost is over 23 per cent.

All railroad forms can be printed satisfactorily on newsprint, manilas and plain bonds, on No. 14 and No. 16 stock. Where a large number of copies is required, No. 8 stock should be used. The use of higher grades of paper should be discouraged. Mimeograph paper should not be more than No. 16 in weight. Some lines successfully use No. 16 newsprint for this purpose.

Gang Printing Saves

Savings can be effected, ranging from 10 per cent to 40 per cent, by purchasing printed forms from printers who specialize in railroad printing. It is not necessary, however, for a railroad to group its forms. Quantities from 5,000 to 50,000 can readily be printed in combination runs. Basic sheets, with grades and weights of paper as recommended are available so that the majority of forms can be secured from combination printers. When the railroads have adopted standard sizes, weights and grades of paper, further economies are possible in printing, since the printers can reduce the number of sizes and grades of paper now required.

Use of Ruled Paper Discouraged

The committee considered the standardization of ruled paper. Some member lines use as few as seven ruled sheets for all the statement work, while others use as many as 35 ruled sheets. Generally, the ruled sheets and books are of the better grades of paper, and are expensive. By standardizing on a fewer number of sheets, larger quantities can be ordered which materially reduce the cost. There are numerous items of stationery including blank and ruled paper that are common to all railroads and the trade in general. Several lines have a standard list showing all the miscellanous items used.

Uniform Methods of Packing and Labeling Printed Forms

There does not appear to be any uniform method for packing and labeling printed forms, plain paper, carbon paper, books, rubber bands, twine etc. Stationery and printed forms are perishable items and these articles should be properly packed and labeled when shipped. Uniform wrapping and labeling facilitates the filling of requisitions.

The control of stock in the general and other offices is important since the quantity and condition of stock in these offices has a direct bearing on the purchases. The proper distribution and handling of stocks afford reduced stocks. Some of the more popular methods of control are by personal circulars to department heads with recommendation for economical handling of supplies to avoid waste, also inspections by traveling auditors, storekeepers, and other traveling representatives, as well as by local office supervision. The user of stationery and printed forms should be instructed in the proper use and care of supplies furnished in order to secure the best results in conservation.

Keep Supplies at One Place

All forms that have become obsolete, including tariffs blank on one side should be returned to the stationery storehouse, where they can be used either for printing forms on the blank side, cut up for clip paper, or sold. At the same time the binders can be reclaimed. Stationery stocks should be centralized as much as possible. Where large quantities are used, such as in general and division offices, the stationery should be kept in one place.

The report was signed by: E. J. Lamneck (chairman), assistant purchasing agent, Penna.; C. C. Anderson, stationer, N. P.; F. Blanchard, Jr., stationery storekeeper, B. & O.; D. Delaney, stationery storekeeper, C. & A.; W. W. Griswold, stationer, C., R. I. & P.; V. R. Plank, stationery storekeeper, S. P.; C. Reuthinger, stationery storekeeper, M-K-T.; A. B. Rutherford, general stationer, U. P.; J. L. Bennett (chairman ex-off.), purchasing agent, C. of Ga.

Discussion

C. Reuthinger (M-K-T.): It is a wrong idea to furnish refill pencils to railroad employes. We tried it for over a year and the results were found to be unsatisfactory.

W. W. Griswold (C. R. I. & P.): By anticipating our wants about 60 days, we can have our pencils imprinted without additional cost in lots of 100 gross or more. We like the idea of placing the Rock Island Lines' label on our pencils because we furnish them for use in the dining car department.

In the Stationery Store of the Southern Pacific at Oakland, Cal.

Mr. Erwin (So. Pac.): We have operated a typewriter repair department for eight years which handles dictaphones, typewriters and offices appliance machines. When this department sends a man out on the road he handles all classes of machines such as those mentioned used in office work.

J. U. King (A. C. L.): We have also operated a typewriter repair department for many years in which we repaired 130 typewriters in May at a cost of $1.40 each. The average cost per month per machine in service is 13 cents.

Report On Railway Purchasing Methods

Ways of reducing office work described—a better plan of selling scrap materials recommended

H. L. Taylor
Chairman

The stores departments should requisition the purchasing department according to a time schedule. This assures an equal flow of requisitions and enables the purchasing department to anticipate the period when it is desirable to enter the market. This will also reduce the number of requisitions, bids, orders and invoices to be handled.

Where possible, seasonable commodities such as crossties, piling, etc., and also other material such as rail, fastenings, switches and frogs, etc., should be ordered from the purchasing department so as to enable it to enter the markets under favorable conditions. Where possible, the actual required delivery dates should be specified on the face of the requisition.

It is beneficial to use the same numbering on requisitions, bids and orders. This method assists the stores department, purchasing department and seller, and the identification numbers should be simplified as much as possible. Requisitions and orders should be filled numerically. Definite unit prices, such as prices per lb., cwt., doz., each., gross, etc., should be specified on the bid form and these units should be retained on orders and invoices.

Tracing Material

It is the duty of the purchasing agent to see that deliveries are made but he can permit the storekeeper or consignee to trace all orders under his direction. The present Standard Order should be revised and a standard and simplified order form should be developed along same lines as the Simplified Invoice Form.

NORTH AND SOUTH RAILROAD
Office of Purchasing Agent

..... 19..

Gentlemen:

TERMS OF SALE

.....

.....

John Doe,
Purchasing Agent

CLASSIFICATION OF SCRAP IRON AND STEEL
Quote Price per Net Ton

Classification Number	Approximate Quantity For Sale	Approximate Quantity Desired	Price	Delivery Point our Tracks

(The Standard Scrap Classification to appear on the reverse side of this form)
(Size of Form 8½ in. x 14 in.)

The undersigned agrees to pay prices named for such scrap material as may be awarded, subject to terms and conditions stated on reverse side of this form.

Date of bid..... .....
(Signature)

.....
(Address)

Proposed Form for Selling Scrap Materials

Should Keep Price Index

All railroads should keep a price index system of railroad commodities, which should include at least the price trends for each of the following: Bituminous coal, steel bars car siding, air brake hose, pig copper, pig iron, linseed oil, fuel oil, waybills, heavy melting steel scrap. This price index should be maintained from actual purchases and a market price should be maintained on such basic items, as pig iron, that are not purchased by certain railroads.

Recording of prices on loose cards in cabinets or in a bound price-book are not desirable. The visible index price card and also the visible loose-leaf price book are better methods.

Urge the Simplified Invoice

Every effort should be made by purchasing agents to get sellers to adopt the Simplified Invoice Form.

Where purchasing departments voucher purchase orders, an invoice and voucher register should be kept in order to eliminate the possibilities of duplicate payments, and to facilitate checking monthly statements.

Scrap Rubber Ready for Market

The maintenance of an inquiry mailing list in a loose-leaf binder by commodities is considered preferable to the card or any other known system.

Favor Codes for Telegrams

A standard telegraphic code should be established between railroads and sellers. An example of this plan is as follows:

FOR ORDERING MATERIAL

Adair—Ship at once to storekeeper.....Wire date will ship. Confirming order number.....follows.

Akron—Ship at once by parcel post to storekeeper..... Wire date you will ship. Confirming order number.....follows.

FOR HURRYING MATERIAL

Almaden—We are badly in need of.....on order..... Ship by freight, advising shipping date by wire.

Ames—We have not received reply to hurry on order.....Wire shipping date.

REPLY OF SHIPPER

Arthur—We shipped your order.....by express on.....

Auburn—We shipped your order.....by freight on.....

The window envelope is beneficial to the purchasing department, particularly if the various purchasing department forms are printed so that, when folded, the name and address registers in the space allotted for it in the window envelope.

Duplicating machines are valuable to the purchasing department as they can be used for various operations to advantage.

Requests for Bids on Scrap

The standard Request for Bids on Scrap, adopted in 1922, should be revised. The present form enumerates the items and description of the scrap on the face of the form. Items and descriptions should be printed on the back of a form 8½ in. by 14 in. and the face of form should show only the terms of sale. The body of the form should be left blank and used when sending tenders to quote only by numbers and tonnage

of that particular classification of scrap for sale. By making this change the entire classification of scrap will appear on the reverse side and bids can be issued by using hektograph or other duplicating process.

The report was signed by H. L. Taylor (chairman), purchasing agent, C. N.; James Deery, assistant purchasing agent, Penna.; J. Eaton, assistant purchasing agent, C. P.; W. W. Griswold, purchasing agent, W. & L. E.; C. C. Hubbell, purchasing agent, D. L. & W.; C. H. Kenzel, purchasing agent, E. J. & E.; F. S. McClung, purchasing agent, T. & P.; C. R. Painter, assistant to vice-president, N. Y., N. H. & H.; R. L. Findal, purchasing agent, N. Y. C. & St. L.; C. E. Walsh (chairman ex-officio), purchasing agent, Penna.

Discussion

J. L. Bennett (C. of Ga.): I should like to know to what extent the simplified invoice form is being used. Some roads furnish their own invoice forms and others depend upon the shipper. We have been trying to encourage the use of simplified forms and have had success in some cases and failed in others.

(The chairman then called for a show of hands which disclosed that about 35 roads represented were using this form.—Editor)

P. E. Mayer (I. C.): Is it contemplated that roads should include in the standard invoice order form the preparation of the requisition with the order form?

Chairman Taylor: We did not feet that this subject could be developed now. When we suggest a standard form we want to try to get that form printed by the various railroads. There would be fewer mistakes if we could all use a similar form.

Report on Terminal Railway Storekeeping

Survey of practices and conditions show room for much improvement in methods

E. H. Polk
Chairman

Four distinct methods of Railway Purchases and Stores operations are in use on terminal roads. They may be divided into (1) terminals owned and controlled by proprietary lines, but operated as an independent unit; (2) terminals independently owned and operated; (3) terminals owned and controlled by one proprietary line, but operated independently, and (4) terminals where tenant lines maintain their own stock, but use joint facilities. There are more than 200 terminal railroads in the United States and Canada with track mileages varying from less than 10 miles to more than 400 miles. The large volume of business handled by these terminal railroads calls for heavy investments in materials and supplies.

Twenty-Five Terminals Studied

Replies to a questionnaire on stock investments, disbursements and other information were received from 25 of the larger terminal companies and the committee also inspected a number of the larger terminal properties. It was found after comparing terminal and trunk-line practices that the investment in material and supplies on hand for the protection and operation of many terminal companies can and should be materially reduced. The 25 terminal companies that replied to the questionnaire reported an aggregate investment in stocks of materials on hand of more than $5,000,000, or sufficient for an average period of 164 days. This leads to the belief that the total value of stocks of materials on hand on terminal roads in the United States and Canada exceeds $20,000,000.

In several instances, the stocks on hand compared favorably with disbursements, while other stocks are in excess of one year's requirements. The favorable showings in some instances are not as good as they appear because some terminal companies permit their operating departments to carry and control certain of the requirements. Other terminal companies are carrying and disbursing stocks for lines operating into the terminal which do not enter the accounts. The operating methods, the ordering and disbursing of materials on some terminal railroads compare unfavorably with the efficiency that prevails on trunk-line railroads.

Terminal Methods Inefficient

Efficient systems of stock control are not in effect and in many instances, practical and accurate stock books are not

Comparative Data From Terminal Railroads

Miles of Track Operated	Total Stock Investment, less Rail, Ties and Fuel	Disbursements less Rail, Ties and Fuel	Days' Supply	Stock Books	Purchases	Delivery by Store	Pricing	Reclamation	Scrap Sorting
30	$15,000	$2,288	198	No	Direct	No	Price Book	Op. Dept.	A. R. A.
176	303,037	88,853	102	Yes	Direct	MW only	Price Book	Store Dept.	A. R. A.
53	203,941	124,169	42	Yes	Direct	No	Price paid, plus freight	M. of E. Dept.	No
51	114,000	Not shown	....	Yes	Direct	Yes	No store expense	Op. Dept.	Separate Scrap Rail & Brass
4	35,649	4,225	252	Yes	Direct	Certain materials.	Price Book	Op. Dept.	Yes
54	49,000	20,000	75	Yes	Direct	No	Price on Bins and book	None	No
358	290,986	43,394	201	Yes	Direct	Yes	Material marked	Very little	A. R. A.
40	40,000	3,600	333	Cards	Direct	No	Lumber and Rail Averaged. All other—Unit Price	Store Dept.	Yes
	65,008	22,208	87	Yes	Direct	No	Price Card	No standard	Yes
33	77,210	8,282	282	Yes	Direct	Car and Engine Material	Price Book	Mast. Mech.	No
79	349,706	170,402	63	Yes	Owning Line.	Yes	Price Book	Mech. Dept.	Yes
28	39,426	4,715	252	Cards	Direct	No	Average Price	Store and Maint. Depts.	Yes
176	425,780	75,102	171	Yes	Direct	No	Price Clerk	All Depts.	A. R. A.
90	117,674	32,180	111	Yes	Direct	No	Invoice Price	Mech. Dept.	No
88	46,359	23,243	60	Yes	Owning Co.	Yes	Price Book and invoice plus freight	Store	No
113	(All Matl.) 200,000	8,000	180	.....	Direct	No	Last invoice price	Op. Dept.	No
94	191,787	14,709	390	Cards	Direct	No	Average	Store Dept.	No
378	570,000	196,000	87	Yes	Direct	No	Last Price. Av. on Track Material	Car Dept.	Yes
125	179,000	80,000	66	Yes	Direct	No	Average	Store & Mech.	Part A. R. A.
94	67,085	11,826	171	Yes	Direct	Yes	Actual Price delivered	Op. Dept.	Yes
25	11,200	(Not shown)	....	Yes	Direct	Yes	From invoices	Mast. Mech.	Rail-Mix. Scp.
164	107,869	40,694	78	No	Direct	No	Cost; Plus freight	Mech. Dept.	No
41	200,584	35,702	153	Yes	Direct	No	Price cards	None	Separate Car from Road
79	153,190	16,777	273	Yes	Direct	No	Last invoice plus freight	Not assigned.	Yes
29	19,324	7,153	48	Yes	Direct	No	Purchase Costs	Op. Dept.	Loco., Car & Track Scrap

maintained. Stock is not inventoried at frequent or regular intervals for the purpose of determining average consumption to provide a basis for replenishments. In some cases it was found that stock is counted only at irregular intervals, not oftener than twice each year, and from an inspection of stock conditions, the committee found that it could be accurately inventoried only, at an excessive cost. Surplus material is on hand with no uniform method for disposing of it to proprietary lines. All losses through inventory shortages and the increased cost of handling are direct losses to the trunk lines participating in and owning these terminal properties.

The purchases and stores officers of terminals where these supply operations exist are not solely responsible for these conditions. Instead, the conditions reflect a failure of the proprietary companies to maintain contacts within these terminal properties. Some terminal properties were not visited by proprietary trunk line purchases and stores officers for years.

Trunk Line Methods Proposed

To improve conditions and reduce investments in stocks and handling costs on terminal railroad properties, full jurisdiction and control of purchases and stores should be vested in the purchasing agent, reporting to the chief executive officer and the care and distribution of material should be under the jurisdiction of the stores department. Stock books should be maintained, listing all items of material carried, and the stock should be classified according to A.R.A. standards. Stocks should be inventoried every 30 days and the average monthly consumption established. All surplus and obsolete material should be listed and reported to proprietary lines periodically. Where surplus material is peculiar to a proprietary line, it should be returned to the line for whose use the material was provided.

Proprietary lines for whom the terminal lines are performing service should inform the terminal railway companies of changes or contemplated changes in standards and should promptly instruct them as to future use or disposition of the material left through such changes in standards. The executive officers of terminal companies should furnish the purchasing officers with copies of all authorities for projects of major importance, and a representative of the stores department should be assigned to insure against an over-abundance of material. Often on large jobs undertaken by the terminal companies, the material expenditure exceed a million dollars.

Pool All Stock

A comparative operating statement should be exchanged between terminal companies, indicating the stock on hand, the disbursements, and the percentage of issues, similar to the comparative material stock report issued for trunk-line railroads. On terminal lines owned and controlled by a proprietary line but operated separately and on those where tenants maintain their own stocks but use joint facilities. Consideration should be given to having one store's organization provide for and handle all material requirements. The majority of material used by different railroads is standard to all railroads and one stock could be maintained.

Although the majority of terminals are congested and the material is scattered, savings are possible if facilities would be provided, with open type racks, mechanical material handling appliances, motor vehicles for the delivery of material between stores and to the work, and concrete roadways. It has been proven on trunk-line properties that such facilities tend to reduce the stock investment and they are justified in lower handling costs.

Because a large number of the terminal operations are within the larger metropolitan districts, the high real estate values and the higher rates of taxation, should be considered and every effort put forth to conserve space and hold inventories to a minimum consistent with efficient operation. An annual survey of the terminal railway properties should be made by a committee of purchasing and stores officers of the proprietary lines. Such a survey will be of mutual benefit.

The report was signed by: E. H. Polk (chairman), district storekeeper, S. P.; V. N. Dawson, assistant general storekeeper, B. & O.; J. C. Dods, general storekeeper, K. C. T.; J. W. Hagerty, general supervisor purchasing department, Penna.; W. J. Kelleher, division storekeeper, I. C.; C. A. Marshall, division storekeeper, C. R. R. of N. J.; H. A. Smith, purchasing agent, T. R. A. of St. L.; C. W. Yeamans, purchasing agent, C. & W. I.; A. S. McKeligon (chairman ex-officio), general storekeeper, S. P.

Discussion

F. W. Brown (A. C. L.): Where a terminal is operated jointly by tenant lines, do these lines furnish the material and how is it priced?

Chairman Polk. There should be a small organization in every terminal to operate its store. It should pattern after one of the proprietary lines, perhaps selecting the good practices of several.

J. C. Dods (K. C. T.): Any material that we purchase from tenant lines is billed to us and when used is billed back at the original price, plus cost of handling. Any material that can be purchased in the open market and that is used on several of the lines is bought and handled the same as on a trunk line.

Report on Supply Department Safety Practices

Survey of food sources given in first study of subject by the Association—Specifications for buying

H. N. Mellor
Chairman

The outstanding change in the American diet during the last generation is the striking increase in the consumption of fresh fruits and vegetables. Due to the rapid refrigerated transportation of the railroads, these foods are available at all seasons of the year.

A study was made of the origin and distribution of 18 principal fresh fruits and vegetables, of which more than 900,000 carloads are shipped and received in this country yearly. White potators ranked first being nearly one-fourth of the total; then came grapes, oranges, apples, lettuce, cantaloupes, watermelons, onions, cabbage and tomatoes, in the order named. Of the carload shipments, 31 per cent came from the state of California; Florida supplied 10 per cent; and next in order were New York, Virginia, Maine, Washington, Georgia and Texas.

New York City is the largest receiving and consuming market in the world, taking 22 per cent of the total produced in this country, about twice the receipts of Chicago, which is followed by Philadelphia, Boston, Detroit, Pittsburgh and others. New York received approximately 194,000 carloads of fresh fruits and vegetables by rail each year. About 40,500 carloads are imported from the Argentine, the Bahamas, Canada, Chili, Cuba, Denmark, Egypt, Holland, Italy, Mexico, Porto Rico, Spain, the Virgin Islands and other West India Islands. Of the 40,500 carloads imported 25,000 carloads are distributed by rail to various large railroad terminals throughout this country, affording a very wide selection of the best known varieties.

At the southern and western loading points, fresh fruits and vegetables are carefully selected and graded to sizes, wrapped in paper for protection and packed in suitable containers for loading in refrigerator cars. When it is necessary, ethylene gas is liberated in the cars to ripen their contents by the time of arrival at destination. Rapid refrigerated railroad transportation delivers daily a fresh supply in time for the scheduled opening of markets. On arrival, the ladings are placed on display, and the fruits in most instances are sold by auction, while the vegetables are disposed by regular sale.

Buying Fruits and Vegetables Wholesale

Large receivers in the markets receive daily an abundance of choice fresh supplies that may be purchased at wholesale prices. Purchasing agents of railroads should avail themselves of this opportunity. Purchasing of fresh fruits and vegetables by telephone is easy, but costly. Direct purchasing by selection and personal contact with market receivers, affords

the buyer the largest available choice stock from which to select, insuring the best at the lowest cost.

The following method of purchasing and selection of fresh fruits and vegetables for a railroad whose commissary supplies a large number of dining cars daily, has proved to be a most efficient operation: When the buyer enters the market, a quick survey is made of conditions. At the same time, prices are secured as he passes from house to house and he then proceeds to purchase his requirements. Highly advertised brands and trade marked articles are not purchased on the assumption of obtaining the best quality. The quality is determined by observing, tasting and testing. Many times the least advertised article is as good at lower cost.

When all purchases have been made, the charge sheets are placed in a sealed envelope for delivery to the receiving clerk at the commissary for checking the receipt of material. The call cards are placed in address order and given to the truckman for his guidance in picking up the material. After the goods have been placed on the truck, the seller presents the sold car to the truckman for his signature as a receipt for the goods. This completes the transaction.

When the truck is being unloaded at the commissary the supplies are placed in the refrigerator and other storage spaces. The packages are opened and held in readiness for stocking the dining cars. Containers such as bags, baskets, barrels, hampers and some crates, when empty, are retained and sold for a fair price.

The Proper Location of Commissary Storehouses is Important

The proper location of a commissary storehouse is highly important to the operation of a railroad, especially in a large passenger train classification yard. All phases of operation applying to each department involved in preparing, stocking and operating equipment should be thoroughly studied so that a commissary storehouse may be located in the most advantageous place for all concerned to achieve the best results in minimizing delays and expense.

A commissary storehouse should be of fireproof construction, with plenty of large windows for light and ventilation. If the dining cars can be placed along one side of the commissary for stocking, the floor should be level with the car door, otherwise equal to the height of industrial trucks used in hauling supplies to the cars. The floor on the opposite side of the commissary should be car level high, with a trap door chute to the basement for use in unloading carload lots.

The building should have not less than two open sides and one open end each with a platform and canopy extending the full length, for receiving and distributing supplies. A building in this form will permit several receiving operations at one time without interfering with the filling of orders and the distribution.

At the end of the building, trucks delivering fresh and smoked meats, poultry and sea foods can be unloaded into receiving and inspection rooms and through the rear aisle into the back doors of refrigerators. On the back platform, car-level high, a part may be used for storing empty containers, cases and bottles. A section should also be set aside for receiving carload shipments of heavy packages that can be conveyed to the basement through a trap door and chute. At the opposite end of the same platform, a receiving room is necessary for beverages, fresh fruits, vegetables, groceries and dairy products, all of which can be placed in assigned rooms and refrigerators through the rear entrance and at the same time permitting the filling of orders through front doors. This leaves the entire platform in front of the commissary clear for stocking cars direct or for loading supplies on trucks for conveyance to cars in various parts of the yards.

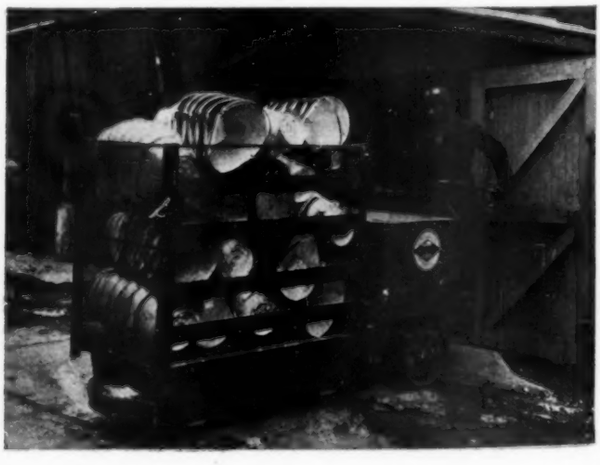
In the interior of the commissary ample aisle space leading to the various places of storage and delivery counters is essential for fast and efficient service. Another feature important in the maintenance of a commissary storehouse is cleanliness. Every refrigerator should have at least two floor drains, besides several others properly spaced in main receiving and distributing floors for the disposal of water in the daily operation of cleaning and scrubbing. The ceilings and walls of refrigerators and the main commissary should be finished with a highly polished surface to reduce the collection of dirt and dust.

The committee included in its report specifications to be observed in the purchasing of tablecloths and napkins, chinaware, silverware, canned and bottle goods, dry groceries, perishable fruits and vegetables, meats, poultry, dairy products and sea foods.

The report was signed by: H. N. Mellor, (chairman), commissary buyer, Penna.; T. M. McKeown, assistant general purchasing agent, C. P. R.; H. A. Hansen, supt. dining car and hotel department, U. P.; L. M. Jones, superintendent of sleeping and dining cars, C., M., St. P. & P.; Geo. E. Johnston, general storekeeper, B. & A.; W. M. Portlock, purchasing agent, S. A. L.; T. K. Russell commissary storekeeper, I. C.; C. E. Walsh, (chairman ex-officio), purchasing agent, Penna.

Discussion

W. F. Jones (N. Y. C.): One of the large items of inside dining car expense is linen or cotton for the table and kitchen, and the apparel for the cooks and waiters. Notwithstanding the precautionary measures taken to insure quality, we are confronted with an expense for laundering which carries with it the expense of rapid deterioration of the fabric. A recent test by two railroads using linen from the same factory where the count and tensile strength were the same, resulted in one road getting 65 percent more washings than the other road. If we can increase the life of linen including cotton goods only 35 percent, we can make a substantial saving.



Comparative Costs of Unloading and Storing a Car of Tinware

Old Method	
Hand trucking on average of 300 ft.:	
Labor loading and unloading	$3.94
Labor trucking	3.64
Total	$7.58

New Method	
Loading skids	$1.97
Trucking, 300 ft.	.36
Truck cost, including interest, depreciation and repairs	.36
Total	$2.69
Net Saving	$4.89

Report on Delivery of Material to Users

More trucking equipment for terminal use needed and its unified control urged

H. M. Smith
Chairman

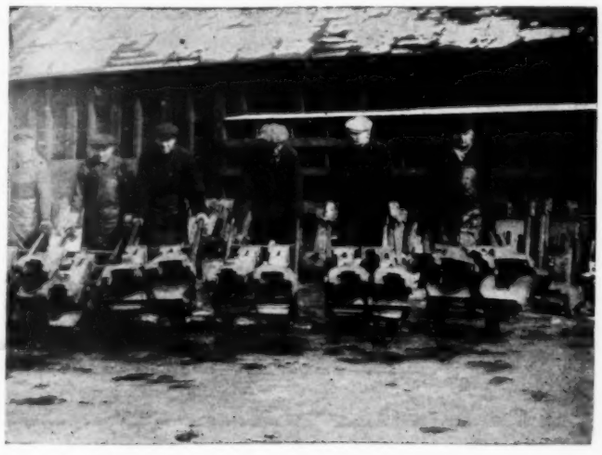
The committee emphasizes the need for constantly adding to the items of material handled and the duties performed by supply trains to secure efficiency. A further study should be made of supply train delivery of crossties, switch ties, rail and other large items so that special work-train service may be reduced to a minimum.

Supplies for Cabooses and Locomotives

The committee recommends stores delivery of supplies to cabooses, but is not ready to recommend handling locomotive supplies by the same method. At large points, where the entire service of one or more men is required, the work should be handled by the stores department, but at smaller points, where only part time service is required and the stores department force is small, the work can be done more economically by wipers, call boys or other low-priced labor in the mechanical department, as usually their special work does not require their full time.

Divided Truck Operations Uneconomical

Power and hand equipment for handling and delivery equipment is in most cases under the divided control of the stores and mechanical departments. In some cases, other departments control and operate similar equipment. Such an arrangement is not logical or economical. Some roads have placed their equipment under control of the stores department, and others under the mechanical department. Although the latter arrangement is reported to be working satisfactorily, the committee does not endorse it. The stores department is peculiarly fitted for handling this class of work and the equipment should be placed in charge of the stores department.



Handling Repaired Couplers

Couplers straightened under steam hammer and moved approximately 50 yds. to furnace and then 50 yds. to fit-up yard.

Above—Old Method

One man handling two couplers on warehouse truck consumes six and one-half minutes.

Below—New Method

Electric truck moves twelve couplers and returns for second load in three minutes. If man power could keep up above schedule all day, the comparison would be thirteen to one, in favor of lift truck.

The Old and New Way of Handling Cabs

Above—Old Method

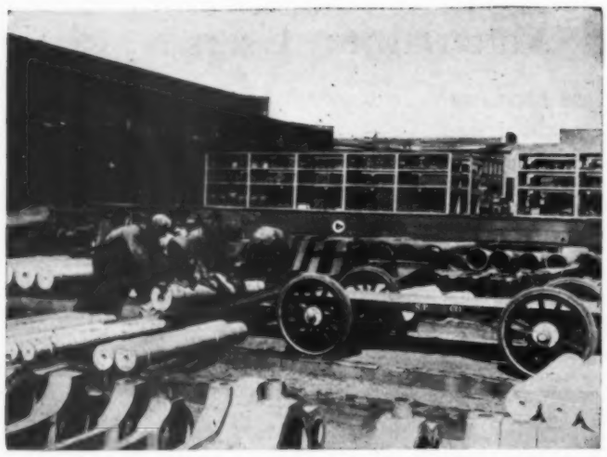
Labor loading and unloading	$0.18
Labor trucking	.48
Total	$0.66

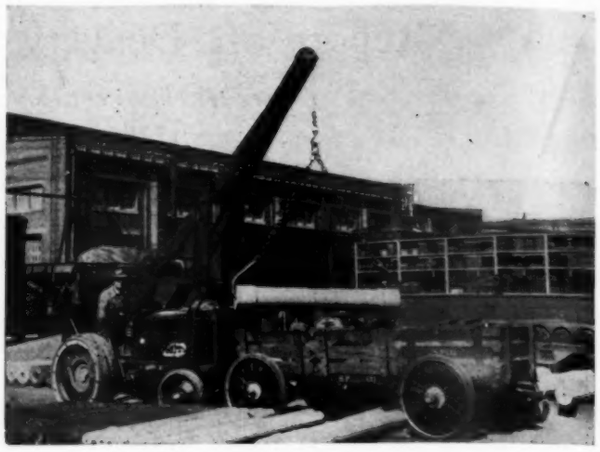
Below—New Method

Trucking labor	$0.08
Proportion cost of truck and including depreciation, interest and repairs	.08
Total	$0.16
Saving	$0.50

Savings by Lift Trucks

The lift truck and skid method of handling has come into

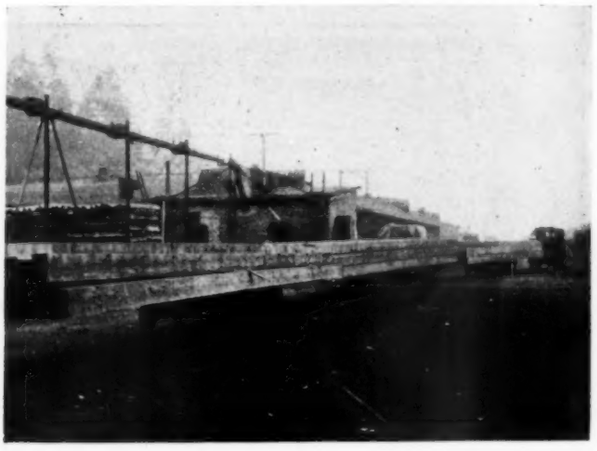




Handling 1,385-lb. Driving Axles

Old Method	
Labor loading and unloading	$0.18
Labor trucking	.48
Total	$0.66

New Method	
Trucking labor	$0.08
Proportion cost of truck and including depreciation, interest and repairs	.08
Toal	$0.16
Saving	$0.50

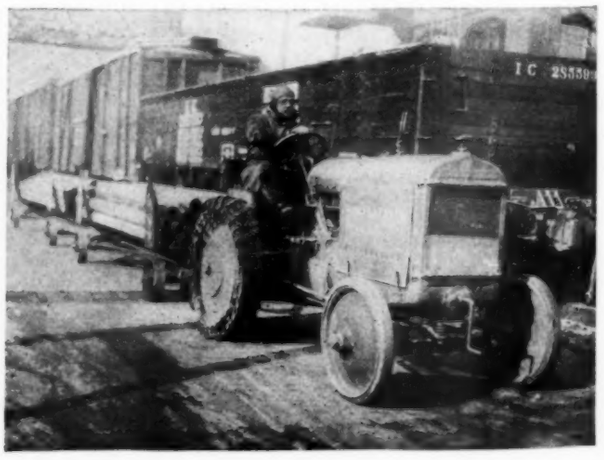


Comparative Costs of Moving Timber to Mill

Old Method	
Teamster, 1 day	$4.32
Horse feed, 1 day	1.00
Total	$5.32

Eight round trips per day with one load, makes cost per load $0.66½ ea.

New Method	
Chauffeur, 1 day	$4.32
Gasoline, 1 day	1.20
Total	$5.52
Sixteen round trips per day with three loads each trip, makes cost per load	$0.11½
Saving, per load	.55



The Old and New Way of Handling Boiler Tubes

Old Method	
Push car trucking an ave. of 600 ft., one set of engine flues.	
Labor	$0.96

New Method	
Tractor and trailers handling same operation. Labor	$0.08
Truck and trailer cost, including depreciation, interest and repairs	0.12
Total	$0.20
Saving	$0.76

considerable prominence in the last year or two. Decided savings can be effected in a great many material handling operations by the use of lift trucks and skids, but it should be remembered that this equipment is only supplementary to tractors and trailers. Care should be taken not to adopt this method to the extent that savings on other economical operations are lost. Investment is a deciding factor in determining the extent to which each type of handling can be carried on economically. Roads contemplating lift truck and skid handling should carefully study their problems. If the expenditure for power or hand lift truck and skids can be justified, they should proceed in a careful and conservative way, undertaking store room and intershop deliveries first, and then extending the operations to shipping from the general store to one of the nearer stores so that the skid turnover may be rapid.

Hard surfaced roads are absolutely necessary if full economy and efficiency from motor equipment is to be obtained.

The report was signed by: H. M. Smith (chairman), assistant general storekeeper, N. P.; S. L. Bouque, assistant district storekeeper, S. P.; J. E. Conroy, district storekeeper, C. & N. W.; J. L. Irish, general storekeeper, O.-W. R. & N.; J. B. Livingston, district storekeeper, C. N.; J. V. Miller, assistant general storekeeper, C. M. St. P. & P.; W. S. Morehead, assistant general storekeeper, I. C.; C. H. McGill, supply train storekeeper, N. Y., N. H. & H.; J. W. Wade, general storekeeper, N. & W.; J. W. Watkins, district storekeeper, L. V.; Grover Wonnell, storekeeper, Penna.; F. S. Austin (chairman ex-officio), purchasing agent, B. & A.

Moving Tires from Cars to Shops

Above—Old Method

Four men required four minutes to roll a tire from car to storage, a distance of 18 ft.

Below—Power Lift Truck

One man with a power lift truck can move six tires on a skid to storage in two minutes. On a continuous operation three men with a hand lift truck will accomplish in one hour what four men can do in 6 hours by hand, or three man hours against 24 man hours. On a continuous operation, one man with a power lift truck will accomplish in one hour what four men can do in 12 hours by hand, or one man hour against 48 man hours.

Discussion

J. V. Miller (C. M. St. P. & P.): Every storehouse on the Milwaukee System is equipped with a handling truck. The larger points are equipped with electric lift trucks of which we have nine at Milwaukee We have found that 75 per cent of our material can be handled with a lift truck of some kind. We are handling 20 brake beams to point of use and returning 20 scrap brake beams in which operation we reduced the number of individual operations from 400 to 10. During the last two months we have demonstrated that it is feasible to gather scrap at one section and sort it into 13 classifications while en route to the next section. We have set a goal of $6.00 per $1,000 of material handled as a cost figure. In April of this year we got down to $7.71, whereas in 1922 our cost was $22.40. We found the steel skid the most successful so far, this skid being 12 in. high.

We are now starting to handle oil on skids, putting 9,600 gal. in a box car. In our investigation of lift trucks, we visited approximately 100 plants where we found that any lift truck costing approximately $2,600 will make a gross saving of this amount every 90 days after deducting the operator's wages, where the amount of work to be done approximates that at the average district or general store operated by a railroad company.

Essay Contest On Supply Problems Held

Wages and stock turnover discussed in winning papers of third annual competition for younger men

For the third consecutive year, the Purchases & Stores Division, A. R. A., conducted a contest among younger supply department men for the best paper on the problems of these departments. The contest was designed to stimulate the youth in the purchasing and stores work and was open to all employees below the rank of assistant purchasing agent and assistant general storekeeper. This year Samuel A. Hayden, chief clerk to the general storekeeper, Missouri-Kansas-Texas, Parsons, Kans., and A. G. Bohorfoush, chief stock clerk, Southern, Birmingham, Ala., were selected from about 35 entrants as the authors of the best papers, and were rewarded for their efforts by a trip to the annual meeting at San Francisco to present their papers in person. Both winners were participants in previous contests.

The articles submitted, which were less in number than in 1928, were judged upon a basis which allowed 50 per cent for the originality of the ideas, conclusions and solutions of the problems presented, 25 per cent for the general interest and importance of the subjects selected, 20 per cent for conciseness and clearness of expression, and 5 per cent for general appearance and neatness. The judges were H. C. Stevens, general storekeeper, Wabash; L. C. Thomson, manager of

stores, Canadian National; and J. L. Burnett, purchasing agent, Central of Georgia.

The prize winning papers were in part as follows:

Improvement in Service is a Vital Necessity

By Samuel A. Hayden

Chief Clerk to General Storekeeper, Missouri-Kansas-Texas, Parsons, Kans.

S. A. Hayden

Whenever we touch upon the subject of supply service, we get a glimpse of what is perhaps the most effective means devised in the history of the railroads to further their progress. While rapid strides have been made toward the attainment of the ideal in organization and service, the need for continuous improvement is more than a policy, it is a vital necessity.

More Wages for Store Departments

In building the organization we should not lose sight of the fact that a successful organization will develop principally through the intelligent and constructive leadership of the heads of that organization. Leaders of the future should spring from the ranks. To develop the right kind of leaders we must first build a firm foundation by developing the right kind of employees. To do this we must be able to offer employees and prospective employees the proper inducement first to join our organization and then to stay with it.

The wage rate structure of the supply organization as a whole on all railroads does not compare favorably with the wage rate structure of the locomotive, car, maintenance and other departments with whom the supply service must compete in the selection of its personnel. A careful analysis of wage rates, with the resultant equalizing adjustment to the scales paid employees of other departments, will do more to improve the intellectual worth of the rank and file than any other one thing we could undertake.

Control of Supply and Demand

Upon our ability to exercise reasonable control over supply and demand depends in large measure the profitable operation of the entire railroad property. Stock books, stock records and master stock books are the recognized medium of control of the more fluid items, and while they have their limitations, they constitute the best method yet devised for the procurement of future requirements and for the detection and distribution of surplus and slow-moving stocks. Much material is procured to protect new equipment or devices or requisitions submitted by the users, which are based only on the manufacturers' recommendations of what should be carried to protect anticipated and unlikely failures. There is much more of this kind of ordering than is realized. As past experience has shown the futility of such ordering, we should insist upon the closest sort of co-operation of the using departments so that the greatest possible measure of control over such stocks can be exercised.

The Budget as a Medium of Control

One of the greatest and least explored fields of activity, open for the development, and one which falls directly within the control of supply and demand, is the budget plan of controlling expenditures for material and supplies. Much money can be and is tied up in material for large maintenance projects and repair programs. Often it is tied up for unnecessarily long periods of time, simply because of the failure to schedule or budget the work so that an intelligent effort can be put forth to have the required material delivered more nearly with the actual undertaking and progress of the work. A broad plan would consist of: (1), The executive budget, formulated in advance by the management, outlining definitely the improvements and activities to be handled over a given period of time, based upon the finances available to carry on the projects; (2), a working budget clearly outlining when and how the work is to be done; (3), a purchase budget to conform to the working budget to permit of the most judicious expenditure of the money for the needed materials; (4), a vigorous and earnest effort to stick to them.

Stores Delivery Saves Expense

Efficient store delivery systems should be operated. Such systems have eradicated many of the old evils associated with the "cash and carry" systems and permit better distribution and supervision of issues. The supply train serves the same purpose to the line material users as the store delivery to the shop forces. Both plans place representatives of the supply service in direct contact with the users of material, with first-hand information as to the need for material, and place the material where it is to be used, with the minimum loss of time and in the most economical manner.

Specifications Important

It is generally conceded that the quality of material now purchased is better than heretofore. The most important factor entering into this are specifications, by which suitable material can be manufactured at the most economical price for almost every purpose required, insuring a greater degree of safety in operation, economy in handling and efficiency in application. The use of sound specifications, clearly defining requirements of quality, cannot be objectionable to any progressive manufacturer because such specifications not only safeguard the product sold to the purchaser but act as an actual guarantee of its quality.

We no longer find the real cost of material on the price tag and will no longer make the mistake of buying solely on a price basis if we but look beyond the purchase price to the cost of using the material. Good materials cost the least.

Improved Facilities Pay

On most railroads, the days of box car body store-rooms are gone. Railroad managements realize that modern, sanitary, properly lighted storerooms, planned and built for the proper housing and economical handling of material, are paying investments, and this thought should be kept plainly in view. Automobile trucks, electric crane and lift trucks, store delivery trucks and similar devices have already cut the labor bill thousands of dollars, and the further development of this field will save additional thousands of dollars for the department and for the railroads.

Reclamation Still Young

While the reclamation and recovery of material is comparatively in its infancy, intensive study has resulted in the saving of hundreds of thousands of dollars to the railroads within the past few years. Not until an article has reached the stage where it cannot be economically repaired or reclaimed should it be disposed of as scrap. Then it should be sorted and classified in such a way as to bring the greatest possible return to the property. Properly classified and sorted, scrap commands premium prices and with reasonable care, this classification can be accomplished with but little added expense.

Calculating Stock Turnover

By A. G. Bohorfoush

Chief Stock Clerk, Stock Department, Southern, Birmingham, Ala.

Stock turnover is being used more and more as a criterion of supply department performances. It is, therefore, important to have a common method for calculating the turnover of their respective stocks. No true comparison can be made between one railway and another when the methods of calculation, operating conditions, and the policies of the management are different.

A comparison, to be accurate, must be based on results which are reached by the same methods. Investigation reveals that there are many methods in vogue. Some supply departments merely furnish the requirements for maintenance of equipment and are not concerned with the material required for maintenance of way and structures. On some railways a centrally located general store is maintained with various outlying stores drawing upon the general store for supplies as they are required. That obviates the necessity for carrying anything other than material in daily demand at the outlying stores. On other railways there are two or

more general stores, while on other railways, each divisional store is self-sustaining and independent of the others.

The various methods of handling and accounting for scrap and reclaimed material presents a difficulty. On some railways the reclamation plant is operated as a separate unit and the material is not taken into the account until it can be used.

Items like air pumps, injectors, lubricators, driving boxes and side rods, which are rotating constantly between the machine shops and the erecting shops and roundhouses are not handled at all by some railways. Others only consider them at inventory time by taking them into account through a credit to operating expenses in the month the inventory is taken and charging them back to operating expenses in the month following.

Any standard method for calculating stock turnover must be broad and flexible enough to adapt itself to the various conditions prealing on the different railways. It must also be a method which will reflect accurately the responsibility of the officers of the supply department for the conditions which prevail in their department and the efficiency with which they are discharging their duties.

The gross total of all material and supplies on hand for the use of transportation, roadway, mechanical, signal and other consuming departments, should constitute the point from which the calculation should begin, but not the basis upon which it should be based. From the gross total the following items should be deducted to give a net total common to all railways and to reflect accurately the turnover of the stock for which the officers of the supply department should be held responsible.

(1) The total value of all scrap on hand. The regulation of this item is beyond the control of the officers of the supply department. They do not know when equipment is to be retired and dismantled, nor do they know when the market will permit the sale of the scrap which will necessarily accrue from the work of dismantlement. By the term scrap is meant all items of material which are common to roadway, mechanical, signal and other departments which cannot be used again without being reworked.

(2) The total value of all material on hand at reclamation plants. There is much material reclaimed for which there is no immediate use. The supply department should not be burdened with the value of such material. Its value should be included with that of other scrap until it is withdrawn for use.

(3) The total value of all relay rail and its accessories which have been replaced by heavier items of a similar nature. The supply department should not be held accountable for the material released when the policy of the management calls for an increase in the weight of the rails; more so when the sale of the material released is dependent upon so many contingencies.

(4) The total value of all new rail and accessories bought for the specific purpose of increasing the capacity of the roadbed. This is the result of the policy of the management and the material is bought and stored according to its plans for the work. The supply department has no regulation over this work and it should not be reflected in the stock turnover.

(5) The total value of all material bought for specific improvements. This, like item (4), is dependent upon the policy of the management and is not brought about by any act of the officers of the supply department.

The basis for stock turnover should be:

Gross total of all material and supplies for all consuming departments	$.....
Minus Deductions	
Total value of all scrap	$.....
Total value of all material at reclamation plants	.....
Total value of all relay rail and accessories	.....
Total value of new rail and accessories intended for increasing capacity of roadbed	.....
Total value of new material for specific addition and betterment projects	.....
Total of All Material to be Deducted	$.....
Balance—Net Total	$.....

If certain items of material are to be deducted from the gross value of material on hand, it follows that credits or charges to cover the items which are exempted should not enter into the disbursement charges which are to be compared with the net total of material on hand. The supply department should not receive credit for the following:

Total value of all scrap sold	$.....
Total value of all material withdrawn from reclamation plants	.....
Total value of all relay rail and accessories used and sold	.....
Total value of all new rail and accessories used in increasing capacity of roadbed	.....
Total value of all new material used on addition and betterment projects	.....

This leaves the actual material charges to maintenance of ways, structures, equipment and transportation. To these should be added the material transferred to storehouses of affiliated lines which are dependent upon the general storehouse of the parent railway for their materials and supplies. Transfers of this nature are under the supervision of the officers of the supply department and they should be allowed to credit for them inasmuch as it is their duty to supply the material which does not appear in the total upon which the calculation is predicated. The fact that they must supply these storehouses necessitates carrying material to meet the demand. Such material appears in the net total on hand and, when it is transferred, its value should be added to the total of the net disbursements in order to obtain a result which will reflect the efficiency of the department.

Stock turnovers which are calculated in this manner would afford a basis of comparison between the supply departments of the various railways. The results obtained would reflect the ability of the officers of the supply department in the management of their affairs, and this, in the final analysis, is what the stock turnover should reflect.

Report on Pricing and Marking Material

Putting value of material on bins held deserving of study—Permanent stenciling approved

J. J. Kukis
Chairman

During the year, the committee investigated the pricing system on various railroads and the results indicate that little effort has been made by the members of the Division to try out the recommendation of last year's committee. The few roads using the method are enthusiastic as to the benefits but the committee has been unable to obtain any cost figures for installing such a system. However, the committee believes that the plan has some merit and it is recommended that the plan be studied and that various railroads put into effect the recommended pricing system at one of their larger stores or at a division store where the stockmen or helpers will price all material issues and that this be done as the material is issued or shipped and in the immediate vicinity of where it is stored.

It is further recommended that the railroads keep a record of the operation of their present and the proposed pricing system for at least three months. This record should include:

1—Cost per 1,000 items priced, the cost to include figuring the prices on invoices or store orders, posting price books or price cards, correcting bin labels and entering prices on requisitions. Where pricing is done by the stockmen or their assistants the cost of entering prices on requisitions should be estimated after checks have been made to show the time required for a given number of items.

2—Errors detected per 1,000 items priced, this to be determined from test checks of requisitions priced by both methods.

It is further suggested that if it is found inadvisable to continue the subject of Unit Pricing, consideration be given to recommending a standard pricing system, following the present practices which are in use on most of the railroads. The central pricing bureau, which is in effect on some of the railroads, offers opportunity for much economy.

Piling and Marking

Considerable economy is effected and time saved by the application of permanent unit piling and unit marking of materials. The committee stresses this method, calling particular

attention to large quantities of material stored. By a careful study of local conditions, a permanent unit marking can be applied to suit such local conditions.

For large quantities of round or flat iron, pipe flues, etc., stored in iron rack or in piles, the permanent unit count can be marked on the uprights of such racks or partitions. When such items as long belts, tank hose, etc., can be piled in a certain space or rack, the permanent unit count can be marked on the fact of the upright on the front of the material rack.

The committee recommends that, especially in large stores, bulk material such as nuts, rivets, washers, bolts, etc., carried in kegs, boxes, bundles, etc., should be so piled that a permanent unit count can also be applied.

Permanent unit piling and marking will avoid the necessity of remarking or restenciling each time that it is necessary to replenish the material that has been used, effecting a considerable saving in labor as well as time.

The report was signed by: J. J. Kukis (chairman), superintendent of stores, Erie; F. I. Foley, general storekeeper, N. Y., N. H. & H.; A. V. Gilbert, purchasing agent, A. B. & C.; J. W. Gorsuch, general material supervisor, Penna.; R. R. Jackson, division storekeeper, Wab.; J. P. Kimmel, district storekeeper, C. St. P. M. & .; J. Maier, storekeeper, C. B. & Q.; C. W. Pearce, division storekeeper, C. M. St. P. & P.; L. B. Wood, general storekeeper, S. P.-Texas Lines; J. E. Mahaney (chairman ex-off.), C. & O.

Discussion

E. D. Toye (Canadian National): The report states that the opinion of the members is that the recommendation of the committee last year be modified. What has the committee in mind?

Chairman Kukis: The committee offered a definite recommendation last year that the pricing of bin tags be made standard practice. This committee has been unable to decide that its recommendation is the best system.

J. T. Kelly (C. M. St. P. & P.): Where reference is made to permanent unit piling, does the committee mean that or does it mean permanent unit piling with permanent unit marking?

Mr. Kukis: We mean the latter although the term probably can be shortened to permanent unit marking.

Stockkeeping Methods on the Canadian National

Visible cards prove superior to stock books for ordering, pricing and controlling supplies

By L. C. Thomson

Manager of Stores, Canadian National Railways

L. C. Thomson

The use of master and local stock books has been entirely replaced on the Canadian National and Grand Trunk Western Lines by a visible card index record with a card representing each item of stock in each storehouse. The stock card record gives the consolidated record of that particular item of stock, showing monthly the quantity on hand, the amount due on orders, the quantity now ordering, the requisition number and the quantity received during the month, with the requisition reference; also a record of issues of that material for the month, as well as totals for 3, 6, 9 and 12 months. The card has a capacity for two years' operation on each side. Each card, at the top, gives the name of the article, the number and specification, and at inventory date, the quantity, price and amounts are shown. Additional room is given for its classification and location, and the compartment number and bin number in the store. These stock record cards are mounted on a panel and slide up or down, which makes it possible to see the full particulars as required from the face of the card. The panels contain about 60 cards, and are kept in a cabinet with steel drawers. Each cabinet has a capacity of 24, 36 or 48 panels, according to the requirements of the stock section. They are fitted with casters and are easily moved about the section when taking stock. For casting platforms, iron racks, or outbuildings, where smaller stocks are carried, suitable non-portable cabinets are used. The stock records are sumarized monthly on a bin or shelf card, and the totals carried forward monthly to the stock panel card.

Bin Cards Show Perpetual Inventory

The bin or shelf card shows the accurate technical name of the article, the section, compartment number, and bin or shelf number in which it is located, also the stock record panel on which it is recorded, the classification of the article, its unit price, the quantity on hand at the first of month, the receipts and issues during the month, and the quantity outstanding on requisitions, and requisition references. It also shows the average weight of grey iron, malleable and steel castings. The description, location and classification of the article is constant. The quantity on hand arrived at by actual count at inventory date is shown on the bin cards, and the receipts and issues are recorded throughout the month and balanced at the end of each month, and the new total of the quantity on hand is brought forward.

It is impossible, without unwarranted expense, to take an actual inventory of stock on hand of all commodities monthly, but stockkeepers and helpers are expected to check the balances on the bin cards with the stock on hand by actual count, weight or measurement, of all active items of stock, during their spare time. The bin card immediately identifies the items of stock from which there have been no issues since the last check, thus eliminating the necessity of an actual count, whether or not there has been an issue, and permitting the stockkeeper to concentrate on those cards that show an issue. Immediately after the balance on the bin card has been verified by actual count, the word "checked" is written opposite the balance, showing that it has been arrived at by actual count, so that the store officers and inspectors, as well as stockkeepers, are immediately aware of the last date the balance on hand was verified.

Because it is necessary for the stockkeeper or his helpers to record all receipts and each issue on the card, each card reflects at a glance the status of the stock of the particular item. No time is lost in seeing that the requirements of the stock are properly protected. If the consumption of a certain article is rapid, it is plainly disclosed. Where material is outstanding on requisition, immediate steps are taken to trace the quantity outstanding. If this detailed information covering the individual item of stock is maintained in a stock book and, therefore, not immediately adjacent to the individual item of stock, the stockkeeper cannot be in such close contact with the status of the item.

Where an error is discovered on the shelf card, it is reported to the storekeeper who investigates and corrects both the shelf card and stock record. The shelf card is not an accounting feature, but a stock control feature, providing the stockkeeper with an up-to-the-minute record of every item of stock. The information, being summarized, is transferred to the stock record at the end of a 30-day period. The latest available price is the price used in charging out issues.

Bin Pricing Followed

Pricing from the shelf cards by the issuer is nearer perfect than any method we know and decidedly more accurate than pricing in the office by clerks who are not familiar with material. At inventory date this pricing feature speeds up the inventory, as the minute the "On Hand" figures are called from the shelf cards, the prices are also called.

Many cases have been found, also, where stockkeepers have noticed values of material which seemed out of line, and have brought this to the attention of the storekeepers, and thence to the general storekeeper and the purchasing agent. A stockkeeper is in a position to make these comparisons as he has before him the value and the material itself, whereas the purchasing agent buying from a catalogue, or buying technical material, could not be expected to make a comparison of its

relative value. We have received many credits from manufacturing concerns through this method.

The shelf card, with the information it reflects, is a splendid aid and a time saver in checking stock in storehouses by officers and inspectors by giving up-to-the-minute information regarding any individual item located immediately with the item of stock. There is no time lost when inspecting the store by going to the office and getting the stock book and making a survey. The information is all on the shelf card.

Requisitions for the replenishment of stock are placed monthly on a schedule basis for each class of material. This schedule is devolved on such a basis as to provide a uniform flow of requisitions through the purchasing office. The stockkeeper goes through his section, checking classes of stock due according to schedule, balancing his shelf cards and posting his stock cards. When he has completed his check with his shelf cards he has a complete record of every item of stock under his charge. He analyzes each item in the various classes, determining, first what items and quantities should be requisitioned on purchasing department or manufactured in the shops, and second, what quantities of any items of stock should be reported as surplus or inactive.

The quantity to be requisitioned is determined and shown in the proper column. If requisitioned on the purchasing department, a green card is placed behind the card covering the item to be ordered. If the material is to be made in the shops, a pink card is so used that the green or pink signal is seen through a small circular perforation in the panel card.

Color Signals for All Material

When the stockkeeper has checked the panel, it is turned over immediately to the requisition writer and another panel worked on by the stockkeeper. The requisition writer need only deal with cards showing green or pink signals. He inserts the requisition number on the panel card and returns the panels to the stockkeeper without removing the green or pink inserts. The stockkeeper sees that every item showing a green or pink signal has a requisition number or shop order number recorded against it. He will then post his shelf card and remove the colored inserts from the panel. At each requisitioning period, the general foreman or storekeeper goes into one or more sections, according to the amount of time he has available, and immediately before purchase requisitions are typed, examines all the cards on each panel covering classes of material which are being ordered to insure that the stockkeeper is using and ordering only material which is required and in economical quantities.

When the panel cards are checked to determine what quantities of material should be ordered, they are also checked for surplus material. The quantity is noted on the face of the panel card and a blue steel clip is fastened on the card. Before purchase requisitions have been completed, a surplus list is prepared by the requisition writer simply referring to the cards which have the blue clips and reporting the quantity already determined for him by the stockkeeper. When the surplus items have been recorded on surplus lists the blue clips are removed and replaced by red clips, indicating that the surplus item has been located and reported. These lists are prepared in statement form by classes and are submitted to reach the general storekeeper's office three days ahead of the purchase requisitions covering that particular class.

When these lists arrive in the general storekeeper's office, they are recorded on surplus stock panel cards by classes and all purchase requisitions are checked against this record before requisitions are released and forwarded to the purchasing department. The surplus record in the general storekeeper's office is operated by a man who has an intimate knowledge of material and who invariably is in a position to make the substitutions. A quantity of material is not surplus unless it exceeds 90 days requirements, or more, at the point where it is located. The general storekeepers prepare surplus lists of those items of stock which are not being liquidated on the region and exchange these lists with each other.

Determining If All Surplus Material Is Being Reported

Stores inspectors can quickly determine if all surplus material is being reported or if items of stock are being reported as surplus which should not be reported. Stock which has been reported surplus and remains inactive for an undue length of time is brought to the attention of the using department, and considered by a shop committee to determine whether or not the material has become obsolete. Where the shop committee has recommended holding any inactive material, an orange colored clip is put on the card, making it possible to bring these items to the attention of the shop committee at the expiration of that time.

When requisitions are received covering the shipment of surplus material, the issue on the shelf card is circled. When a request is received to supply material to meet emergencies on another territory, the issue is designated by the letter "T". Where an issue has taken place on account of obsolescence, the issue is designated by the letter "S".

Inventory Made Easy

One of the paramount advantages of the card system is the assistance it gives when taking the annual inventory. Each item of stock is counted, weighed, or measured at inventory date, and the balance of stock on hand is recorded on the shelf card in blue pencil. As a compartment is completed, the quantity of stock on hand is transferred to the upper right hand corner of the panel card reserved for information in connection with the annual inventory. At the same time the latest unit price is also posted on the panel card and the complete panel is turned over to the comptometer operator, who makes the extensions and totals each panel. A blank card is slipped in at the bottom of the panel, on which is shown the total and the storekeeper's certification of the stock on hand. Three of these panels are set up at a time and photostated. These photostats are then cut singly and bound. Each panel is numbered to avoid omissions. A summary sheet is made and photostated, showing the panel number, the amount of each panel and the total of all panels, giving the grand total value of stock on hand. This summary sheet is supported by the photostat copy of each panel, together with the necessary supporting statements, such as "Material Received and not Invoiced," "Material Invoiced and not Received," etc., representing the complete inventory.

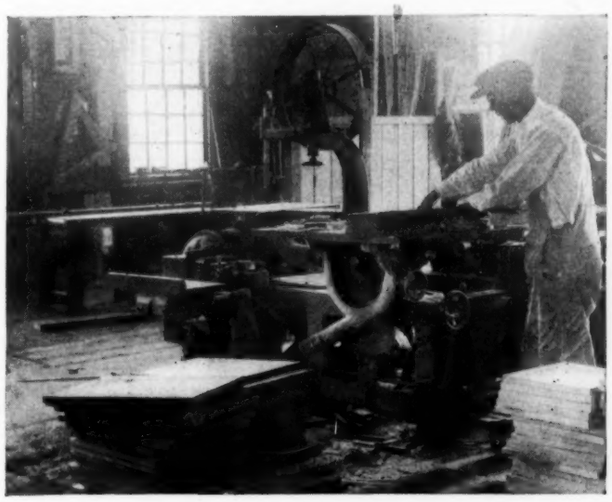
Eliminates Many Operations

The procedure eliminates many operations, such as the transcribing and typing of the description, quantity, price and value of all items of material, the checking back of typewritten sheets with stock records, and the pricing of the inventory. In a district store with a million and a quarter dollars' worth of stock, the complete inventory is in the hands of the auditor within 12 to 15 days after the first of the month. It could be placed in the hands of the auditor in less time if it was necessary.

No additional staff was engaged when adopting this stock method. Office price clerks were eliminated and absorbed in the store itself. There is no staff at headquarters engaged in handling master stock book records and the stockkeeper in the section is not only in close contact with the material but is also thoroughly familiar with its use.

Total stocks in 1923 were valued at $52,418,345.86. In 1928 they were valued at $38,293,656.29, while controllable store stocks were reduced over 50 per cent. The success in effecting this reduction in the face of increased business is largely attributed to the stock control system.

(The paper was followed by moving pictures explaining the equipment and procedure described by Mr. Thomson.—EDITOR.)



In the Wood Mill at the Union Pacific's Reclamation Plant at Evanston, Wyo.

Report on Simplifying Stores Stocks

Surplus supplies can be reduced by cutting down varieties—Too many sizes of items

L. V. Hyatt
Chairman

Following the custom of previous years, the committee selected certain groups of materials and determined by questionnaire the number of sizes used and recommended by different roads. Information was gathered from 22 roads and the committee recommends the use of this information as a guide to railroads in the simplification work.

In a questionnaire about rivets, the roads were asked to state (1), what kinds of heads are regularly listed in their stock books; (2), if the road lists and carries both boiler and structural grade rivets; and (3), if the structural grades are purchased at a lower price than boiler grade. Five roads use cone head rivets in the boiler grade only. Some roads stated that the structural grades were purchased at a lower price than the boiler grade rivets while others pay the same for both grades. The manufacturers' standard price list gives no differential in cost between these two grades of rivets. In the interests of simplification all roads should consider standardizing on the "boiler" grade. This will provide uniformity of specifications and standard heads, tending to reduce the manufacturers' cost.

Seventy-Six Different Hack Saw Blades

A total of 22 roads canvassed reported 76 different standards of hack saw blades in use. This great variety is caused by slight and unessential differences in width, thickness and the number of teeth. The committee recommends that railroads confine their needs to the following standards:

Hand Saws.....	½ in. by 12 in.—.025 in. thick—18 teeth
Power Saws	1 in. by 14 in.—.049 in. thick—14 teeth
Power Saws	1 in. by 17 in.—.065 in. thick—10 teeth

Too Many Sizes of Hose

The committee has studied the hose sizes and recommends the use of the following for the purposes indicated:

Air hose, ½ in., ¾ in., 1 in., and 1⅛ in. (tail hose only); steam or hot water hose, ¾ in., 1 in., 1½ in., and 2 in.; cold water hose, ⅝ in., 1 in., 1¼ in., and 1½ in., gas hose, ⅜ in. for acetylene and ¼ in. for oxygen; fire hose, 2½ in. or 2⅝ in. cotton covered double jacket rubber lined; 2½ in. or 2⅝ in. unlined linen for use inside of buildings, and 1½ in. unlined linen for the same use; corrugated tank hose, 2½ in. by 48 in. for old power; 3 in. by 48 in.; 3½ in. by 48 in. and 50 in.; 4 in. by 48 in., and 4½ in. by 48 in.

Motor-Car Parts Offer Savings

The committee canvassed the roads to determine the status of stock keeping for roadway motor cars. The replies show that the various railroads list in their stock books a large number of motor-car parts for the different makes, as shown in the following tabulation:

No. Parts	Kinds of Cars Protected	No. Parts	Kinds of Cars Protected
497	2	1,389	7
1,624	5	971	9
500	3	606	4
1,600	5	372	2
1,803	5	1,895	3
782	3	474	8
1,545	5	1,495	12
895	6	1,206	4
1,550	4	472	5

Fewer Belting Sizes Favored

As a result of its study, the committee recommends that the supplies of different kinds of belting should be limited to the following sizes: Single ply, medium leather, 1 in., 1½ in., 2 in., 2½ in., and 3 in.; and double ply medium leather, 1 in., 1½ in., 2 in., 2½ in., 3 in., 3½ in., 4 in., 4½ in., 5 in., 6 in., 7 in., 8 in., 10 in., and 12 in. For axle lighting, the majority of roads use only one width, either 4 in. or 5 in., either in 4 or 5 ply composition rubber. For motor cars, most roads use one size, which is 4 in., 4 ply for all makes of roadway cars.

Eighty-Five Brush Sizes

The number of brushes carried by various roads varies from a minimum of 37 to a maximum of 85. The following types and sizes should meet the requirements of the average railroad:

Wall brushes, 3 in., 4 in., and 5 in.; oval varnish, 6/0 and 8/0; flat varnish, 1 in., 2 in., and 3 in.; flat bristle artist, ½ in., 1 in., and 1½ in.; fitch flowing brushes, 1 in., 2 in., and 3 in.; camel hair color, 1 in., 2 in., and 3 in.; glue brush, 1½ in. diam.; round stencil, 1 in., 2 in., and 2⅜ in. diam.; marking brush No. 6; lettering pencils, Nos. 2, 4, 6, 8 and 12; oval sash, 1 in. diam.; stippling grainers, 3 in. or 4 in.; striping pencils, Nos. 2, 8 and 12; counter brush; 8 in. white wash brush; three or four knot roofing brush; wire scratch or casting brush; 2½ in. round painter's duster; 1¼ in. by 5 in. flat; 4½ in. or 5 in. round car wash; 4½ in. or 5 in. round car scrub; common flat scrub; stove brush; hopper-cuspidor or urinal brush.

Pipe Fitting Sizes Increasing

In the past few years the number of items carried in pipe fittings has been increased approximately 40 per cent because of Interstate Commerce Commission requirements, and all roads, with the exception of one or two, carry fittings in both standard and extra heavy weight grades. It is recommended that roads consider carrying all pipe fittings in extra heavy quality only, the difference in the original cost being offset by the advantages of simplification and the longer life.

Sand Paper and Other Abrasives

The committee recommends the following items and sizes of sand paper and other abrasives in stock: Paper, sand, flint or garnet, in 9 in. by 11 in. sheets, Nos. 00, 0, ½, 1½ and 2; emery paper or cloth, in 9 in. by 11 in. sheets, Nos. 00, 0, ½, 1½ and 2; garnet, rolls 36 in. wide, 50 yds. to roll, Nos. 1 and 1½ grits; emery or carborundum grain, Nos. 40, 60, 80, 120 and 180; emery flour, and sheet abrasive paper with water resisting binder. A number of roads have found it economical to carry emery cloth in 50 yd. rolls in two widths only, as 2 in. and 3 in., or 2 in. and 4 in., in grits Nos. 150, 120, 100, 80, 60 and 50, and have entirely eliminated this material in sheets. This rolled cloth is superior for use on lathes and the minimum amount can be given to the user instead of a large size sheet.

Inactive Supplies Should be Watched

The importance of preventing the accumulation of surplus or inactive materials is emphasized. Whenever a new standard is adopted the stock of the superseded items should be ascertained and the decision as to its disposal should be included in the instructions covering the adoption and application of the new standards. Over ordering of the initial stock of a new standard frequently results in a surplus and all such orders should be carefully policed and the quantities reduced to actual requirements. Surplus often results from taking into stock too much salvaged material from old equipment or structures, and a careful study of requirements of such material should be made before the material is taken into stock.

Whenever new construction work is completed, material is likely to be left over. Such material should be considered by both stores and using departments and all material where usefulness for any other purpose is doubtful, should be disposed of to the best advantage and the loss charged to the proper expense account.

The report was signed by: L. V. Hyatt, chairman, supervisor of standardization, M. P.; G. W. Alexander, general storekeeper, C. of Ga.; J. H. Brown, district storekeeper, C. N.; H. W. Concannon, district storekeeper, S. P.; W. A. Clem, purchasing agent, Reading; L. F. Duvall, assistant general storekeeper, A.C.L.; A. G. Follette, assistant chief material supervisor, Penna.; D. E. Guy, division storekeeper, Wab.; G. W. Leigh, purchasing agent, M. St. P. & S. Ste. M.; E. J. Leonard, division storekeeper, C. & N. W.; P. C. Mayer, purchasing office manager, I.C.; W. O. Wallschlaeger, chief stockman, C., M., St. P. & P.; G. W. Bichlmeir, (chairman ex-officio,) general purchasing agent, U.P.

Discussion

G. A. Goerner (C. B. & Q.): The adoption of new standards and the disposition of material replaced cannot be given too much importance. All too frequently the using department, when adopting new standards, pays little or no attention to the material which will be left in stock in the store. Quite frequently, in order to show the saving necessary to warrant a new standard, they show a large salvage for the old material. When new standards are adopted the stores department should check all the superseded material on hand on the system and determine what the using department is going to do with it.

Report on Preventing Storehouse Fires

Losses of more than $1,000,000 in five years emphasize importance of subject in supply work

W. C. Hunt
Chairman

Statistics compiled by the Railway Fire Protection Association from reports received from the railroads show that losses from fires in storehouse building and contents amounted to $1,672,736 in the table below.

During 1927 the losses amounted to $269,000. There has been a substantial decrease in the number of fires in storehouses during recent years, but the record indicates the need for a continued effort on the part of every store department employee to eliminate the hazard of fires.

The committee has added to previous instructions in the handling various materials, the following items:

Special care must be taken in handling lime in transit and in storage, so that it may be kept thoroughly dry. Unslaked lime is a potential fire hazard. If water comes in contact with it the chemical action will produce sufficient heat to start a fire.

Incinerators should be equipped to prevent escape of flying embers. Portable incinerators should not be placed near buildings, rolling equipment or other flammable material. When filling drums of gasoline, care should be used with fittings to eliminate the hazard of static electricity. Paint and varnish remover stocks should be kept at a minimum and be stored in separate, detached buildings.

Lockers should be of approved metal construction, with sloping top, and should be inspected regularly every month, or more often, if convenient.

Year	No. of Fires					Damage
1923	112	Storehouse	buildings	and	contents	$867,247.66
1924	80	Storehouse	buildings	and	contents	187,001.96
1925	71	Storehouse	buildings	and	contents	327,860.31
1926	49	Storehouse	buildings	and	contents	21,466.34
1927	8	Storehouse	buildings	and	contents	269,160.00
Total	320					$1,672,736.27

Rags used by painters in and around building should be immersed in water each night before men leave work to prevent spontaneous combustion. Waste reclamation plants should be in separate, detached buildings, located at least 50 ft. from other buildings and should be constructed of fireproof material. Exhausted battery elements should be washed carefully to remove all soluble matter and stored in a place where they can dry and cool for at least seven days. The words "Keep Dry" should be painted on the outside of the shipping container.

The committee in conjunction with the Railway Fire Protection Association adopted certain rules applicable to store departments, which are contained in a hand book published by that association. These rules are in part as follows:

Rules for Protecting Material in Stores and Yards

All openings through walls and floors, including elevator shafts, stairways and heating and ventilating ducts, should be protected by automatically closing doors or traps. Where the floor area is sufficient to warrant vertical cut-offs, standard fire walls should be installed. A material reduction can be effected in the fire risk in new or existing storehouses by the substitution of metal shelving for wooden shelving. It is also advisable to use metal office furniture. Where exposure to fire from other buildings exists, wired glass should set in metal frames in all exposed window openings. It is also advisable to install wired glass in metal window frames where loading and unloading are performed.

Automatic sprinklers are recommended as the best form of fire protection when installed in accordance with Underwriter's requirements. Where sprinkler protection is installed, it should be supplemented by interior standpipes. An adequate number of approved chemical extinguishers should be distributed on each floor. A system of outside hydrants and mains, with water under adequate pressure, hose and equipment and trained fire brigade are also recommended. An approved fire alarm system or automatic detecting system should be installed and a watchman's service of the clock system is important.

Separate buildings are recommended where supplies of oils and paints are stored in quantities. Oil and paint houses should be constructed of reinforced concrete, brick or stone, with a concrete slab roof. The flooring should be concrete with a concrete sill at the doorways. Outside platforms should also be of concrete. Windows and skylights should be made of wired glass in metal frames, which should be counterbalanced and provided with fusible links to permit automatic closing. Where ventilators are installed they should be equipped with automatic shutters. All window openings should be protected by fixed wire screens of No. 14 wire, with the mesh not over one-half in. sq.

Basements should be accessible from the outside. When oil and paint supplies are housed in the same building, they should be kept in separate compartments. Foam extinguishing systems and carbon dioxide extinguishing systems are effective for the protection of oil and paint storehouses. Chemical extinguishers of the foam carbon tetra-chloride or carbon dioxide type and pails of sand with scoops are recommended for first

A Fireproof Storehouse on the Florida East Coast at the Miller Shops, St. Augustine, Fla.

aid protection. Outside hydrant protection should be provided. Dope and waste reclaiming should not be permitted inside of store or oil houses. All meters should be of the induction type. Dope vats should be equipped with self-closing covers. Reclaimed or oily waste should be handled only in steel drums, and when stored outside of the building, the drums should be provided with lids.

Lumber Storage

The main supply of lumber should not be stored within 100 ft. of important buildings or railroad tracks. The maximum height of piles should be 15 ft. Lumber yards should be protected by a fence, particularly if adjacent to a public highway. The regular and thorough removal of dried grass and brush, within 75 ft. of lumber yards, is important. Locomotives and derricks in lumber yards should have spark arrestors and the ash pans should be examined regularly. As far as possible, the piles should be separated about every 25 ft. by an 8-ft. alley. Transverse roads should be maintained every 150 ft., and in large yards a clear space of 100 to 200 ft. should be provided to divide the yard into two distinct fire areas. Roadways should not be covered with sawdust or chips. The lumber area should be surfaced with cinders and where any framing is done the refuse should be removed daily.

Garages

Gasoline and electric tractors should not be stored, cleaned or fueled in storehouses or lumber yards. A separate detached garage of fire resistive construction should be provided, the fueling to be handled from an approved pump with gasoline stored in standard containers. Extinguishers should be installed in garages, and on each tractor or truck.

Fire Hazards

The installation of all electric lighting and power systems should be made under the National Electrical Code. Electrical wiring or apparatus should not be tampered with or altered except by an electrician. Smoking should positively be prohibited in storehouses, oil and paint houses, dope and waste reclaiming plants, lumber yards, gas storage, and in and about garages. Care must be taken to prevent a shock which may cause the rupture of the gas cylinder, or the detachment of the valves. Barrel storage on the outside of buildings, either on a platform or on the ground, can be safeguarded by providing a non-combustible shelter over the empty and filled barrels. This will also protect them from the sun's rays and reduce the seepage of oil on the ground.

Nitric acid, sulphuric acid, or muriatic acid should not be kept near flammable materials or containers for such materials. The main carboy storage should be kept outside or in a well ventilated building or vault and the different acids should be separated by bricks, boards or sand to prevent combining in case of leakage. Approved acid syphons, pumps or carboy inclinators should be provided to prevent spilling. Water in large quantities should be used to extinguish fires caused by acids, and thrown from a safe distance. Ignition powder should be kept in metal containers and the same rules should apply to the storage of lamp black. Charcoal should be stored in a waterproof, well ventilated building not used for other material.

The report was signed by: W. C. Hunt, chairman, general storekeeper, M. & O.; I. H. Lance, general storekeeper, D. L. & W.; F. W. Peterson, general storekeeper, Bang. & Aroos; W. M. Robertson, traveling storekeeper, C. & E. I.; C. N. Thacker, storekeeper, N. Y. C. & St. L.; H. C. Stevens, (chairman ex-officio), general storekeeper, Wab.

Discussion

H. Wiendel (U. P.): The piling of lumber solidly is objectionable from the standpoint of seasoning. That item should therefore be eliminated from the report.

A. Schipper (S. P.): When creosoted lumber is piled solid the fire hazard is less. That should be considered before this item is eliminated from the report.

After further discussion the Association voted to eliminate this recommendation of the committee and the report was then adopted.

Report on Supply Department Safety Practices

The committee finds that accidents in supply operations are decreasing and offers recommendations for further reductions

F. A. Murphy
Chairman

It is recommended that all new employees, besides filling out blanks acknowledging that their attention has been directed to the duty of following safety instructions, should be given a book of safety rules. On some railroads reference is not made in the general safety rules to unsafe practices among store department employees. When these books are revised, the stores department operations should be included.

Education Important

All unsafe practices should receive the same attention and cause the same action to be taken by supervisors as though an accident occurred. All minor injuries to employees regardless of disability and damage should be treated as serious accidents.

A prompt investigation should be made of each personal injury, regardless of the nature of the injury, to discover its cause, the responsibility of the employee or supervisor, whether absence from duty is warranted and whether the injured person had been previously injured. The supervising officer or his assistant should accompany the injured person to the first aid room, hospital or home to ascertain all the facts.

A tabulation of each injury resulting in one or more days disability should be recorded on the discipline card of the employee involved. Supervisory employees must be taught to realize their responsibilities for accidents in allowing men to use unsafe tools and appliances. Employees must realize that most accidents resulting in injuries or death do not "just happen", but result from causes that could have been prevented.

Locomotive Cranes

Crane operators should be instructed regarding their duties, and the important rules dealing with the crane's operation should be posted in the cabs. These rules should caution the operator to make sure that the track on which the crane is operated is in proper shape, that he understands fully the loading capacity of the crane at the different lengths of the boom, that proper care is exercised in the blocking and clamping the crane to the rails when handling heavy loads, that the crane is in a proper state of repair and safe to operate, that unauthorized persons are not permitted on the crane and that no persons are permitted to ride loads or chains. Hand derricks used in frog and switch yards should be kept in proper repair, have a brake on the winch to protect the operator, be well clamped to rails and be fitted with proper load clamps to avoid loads slipping or falling.

Cable or Steel Wire Rope

As a general rule, the use of cable in place of chain is recommended because it is easier to handle, inspection is less difficult and because it does not break simultaneously but shows signs of weakness and wear long before it finally breaks.

Cables or wire ropes should be inspected daily by capable foremen and where they show evidence of wear that will impair their strength, should be replaced by new pieces. For ordinary purposes, wire rope should be made of six strands of 19 wires each. Other construction may be specified if desired, such as six strands of 37 wires each. All ropes should be thoroughly lubricated internally with a heavy grease, free from acid, and each piece of rope must be carded with its grade letter.

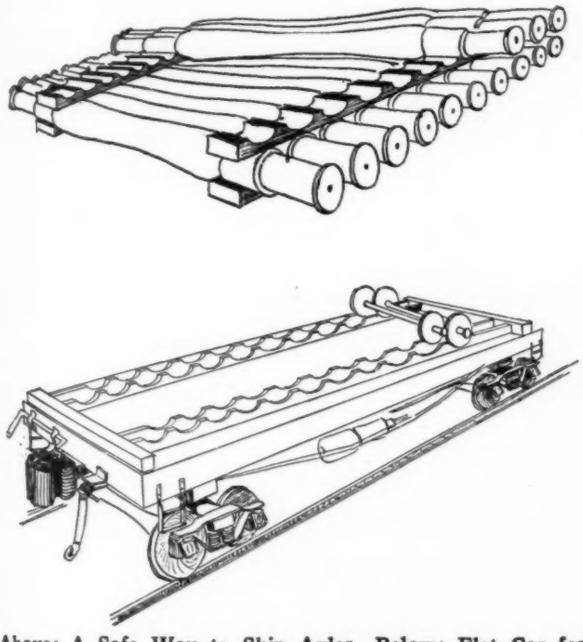
Iron rope should be used on all elevators. Crucible steel should be used for all special purposes where iron or plow

steel grades are not specified. Plow steel rope should be used for all special purposes where the service is severe, and is to be purchased for the special purpose intended and to specifications approved by the chief mechanical officer.

Locomotive and switching ropes may be made of crucible steel and wrecking ropes must be of plow steel and all supplied with extra heavy hooks and links that will stand a strain equal to the strength of the rope. The rope strength should be obtained from tests of the finished rope, and from the tensile strength of the individual wires.

Safety Inspections of Storehouses

Arch brick should be piled solidly and safely in suitable bins or stalls to prevent its being jarred loose. Flag poles, chimneys and stacks on store buildings should be given a periodical inspection to insure that they will not fall. All buildings with slate or tile roofs should be examined frequently and kept in good repair to prevent any parts which may have been loosened during windy periods from dropping on pedestrians. Ice and snow on roofs is dangerous and should be removed promptly.



Above: A Safe Way to Ship Axles—Below: Flat Car for Shipping Wheels

The loading and unloading of soda ash, lime and chemicals of that nature should be handled with gloves as well as respirators and goggles. Improved car movers and not improvised pinch bar movers should be used to move cars by hand due to improper spotting. Live tracks in the close proximity of storehouses should be protected by annunciators or bells and the stub ends of such tracks should be safe-guarded by modern bumping posts.

Truckers should pull their trucks, rather than push them, except on inclines. Where storehouse doors are of a sliding type, truckers should be protected by having the doors equipped with stops to keep the men from getting their hands caught between door handles and door casings.

Care should be taken to keep car and locomotive axles from shifting when being loaded. Loading of mounted wheels can be more safely handled by cranes or hoists. The wheels should be braced. For points using locomotives or electric hoists, wheel cars of cradle design will be found advantageous. They are safer when cars are roughly handled, do away with blocking expense and eliminate injuries to men by protruding nails in loose blocking. At smaller stores where mounted wheels are loaded by means of skids and wheel sticks, precautions should be taken to prevent men from working between the skids.

In handling locomotive tires, power trucks or hand tire trucks should be used. By using hooks with power hoist trucks, the danger will be minimized. Heavy air pumps should be handled by electric lift trucks or suitable dollies.

Large indirect electric light globes should be examined frequently, kept clean, and fastened to prevent their falling. The use of sharp message hooks on, or fastened to desks or walls, should be discontinued. All electric fans should be in proper working order with their blades properly protected. Frequent inspection should be made of large record books with metal backing or edges to avoid sharp or ragged edges.

Gangs on Motive Equipment

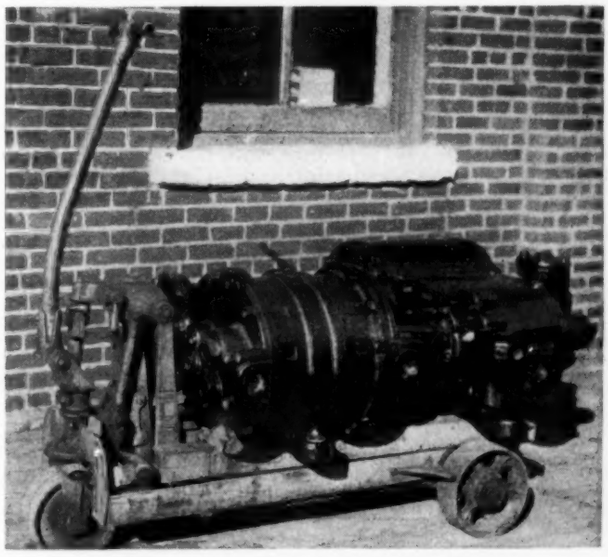
Tractors and trucks should be equipped with horns and brakes. Power truck drivers should always sound warnings when going around corners or coming out of buildings. When hand cranking in garages, care should be used to see that machines are not in gear. When starting automotive equipment in garages, care should be exercised to see that there is proper ventilation to avoid injury from gases.

Lumber Yards

Men handling creosoted products should wear suitable gloves to avoid burns or infection. Where it is necessary to work on piles or on cars containing such material, the use of creepers is recommended. The unloading of used grain doors, either with or without conveyors, is hazardous. They contain many protruding nails and loose boards which might cause injuries, and should be handled carefully.

Scrap Yard and Reclamation Safety

Autogenous cutters should be instructed not to use defective torches and their use should be limited to those familiar with their use. Where sorting tables are used, the men should be careful when removing boards to see that other employees are not hurt by scrap falling on their feet. All shears should be in good repair and handled by capable operators. Scrap dock tracks should be protected by blue flags.



A Safe Way to Handle Air Pumps—On the Missouri Pacific at Sedalia, Mo.

Safer Supply Trains Methods

Only safe, flexible runways and railings between cars equipped with end doors should be used on supply trains. Low type coach steps are advisable on living and office cars, for the safety of train attendants where grades are uneven. In disbursing spikes, bolts, nuts or washers in keg lots from supply trains the use of tongs will prove a safe and efficient method. On some railroads keg skids are used.

Safety in Oil Houses

Care should be exercised to keep from injuring the hands with sharp ends of the wire springs on roads using spring packing waste. To avoid cuts and injuries frequent inspection of steel drums should be made. Portable connections and fittings connecting tank cars and oil house tanks should be protected by red marker lights at night and when not in use, either day or night, they should be stored to prevent possible injury to men tripping over them. Where oil is supplied to shops, through lines from the oil house by an air pressure system, auxiliary tanks equipped with reducing valves

are recommended. At the larger points where acids are purchased in large quantities, the danger due to carboys falling from trucks, breaking and endangering employees, can be minimized by using special trucks. While inclinators are quite generally used for disbursing acids, a pump is preferred, and the adoption of hooks is recommended for handling paints, oils and barreled material when tractor hoists are used.

The report was signed by: F. A. Murphy, (chairman), district storekeeper, B. & O.; T. A. Hodges, general storekeeper, S. A. L.; J. C. Jackson, general storekeeper, G. T. W.; E. H. Landers, general storekeeper, C., C., C. & St. L.; C. Settlemire, storekeeper, U. P.; A. G. Swanson, storekeeper, C. B. & Q.; F. C. Warren, general storekeeper, St. L.-S. W.; G. E. Scott, (chairman ex-officio), purchasing agent, M-K-T.

Discussion

Chairman Kyle: The safety sections of most of our roads have been concerned largely with the mechanical department although we have some bad accidents in our department. I suggest that when we go home we call the attention of our safety supervisor to this problem.

J. G. Stuart (C. B. & Q.): We have found that our men take a great deal more interest in safety work when we have our own safety committees than when they are merely represented on a general committee which devotes most of its time to mechanical department activities.

O. Nelson (U. P.): We have been promoting the safety first idea for many years and have found it necessary for our supervisory forces down to gang leaders to repeat the safety idea to their men daily. Last year we had eight reportable minor injuries in handling 24,000 carloads of material.

L. G. Morrison (C. B. & Q.): We hold a five minute safety committee meeting weekly during the noon hour in each department. We also have a bulletin board in each department showing the number of accidents if any in the various subdivisions of each department, and the comparisons with previous periods. We find that this comparison stimulates our men to keep the records clear.

Report on Regulating Scattered Supplies

Better ways of supplying material for rail programs considered—Less stock required

W. R. Culver
Chairman

The committee desires to impress the importance of proper and complete control of all materials on the line of road. This control to be effective requires co-operation of the using departments.

Watch Outfit Cars and Shop Lockers

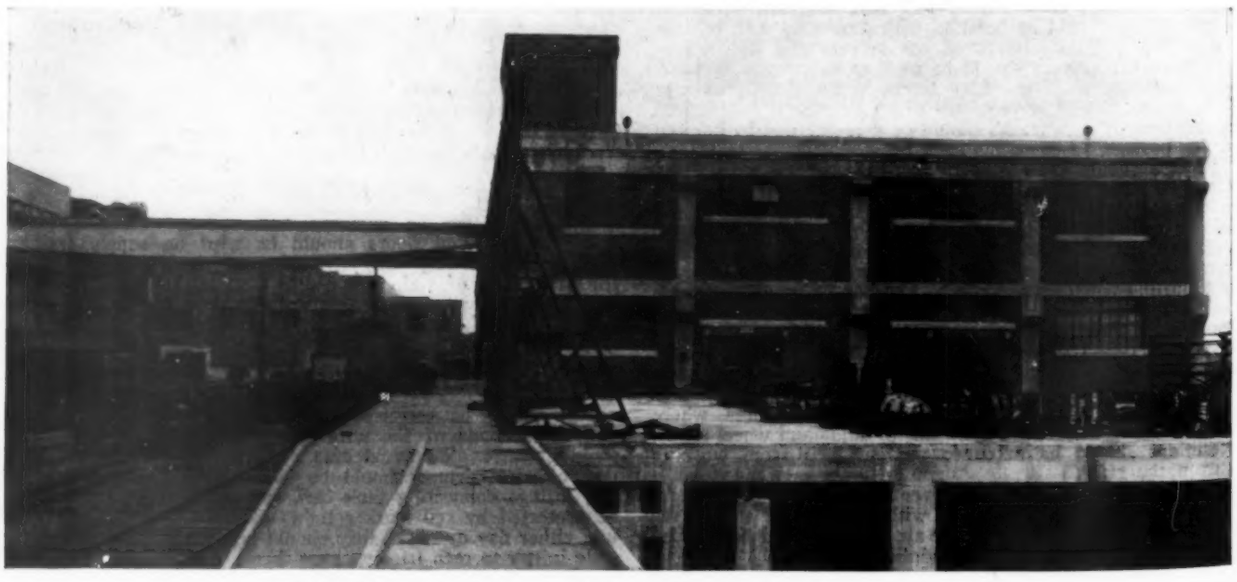
All materials or tools carried in outfit cars used by the bridge and building, signal, water service, paint and extra gangs should be controlled by the store department. There is usually a large quantity of material stored in these cars, which in many instances is an accumulation of material left over from completed jobs. It includes quantities of tools carried after the gangs have been reduced.

A check should be made by a store department representative at intervals, and all surplus material and tools returned to the stores department stock for use elsewhere.

Stocks in the possession of the mechanical and car department, which has been charged out, should be inspected, as a considerable amount of money can become tied up in various items such as tools, hand tool repairs, air brake parts and other items. Shop buildings and cupboards should be checked periodically and the surplus returned to the stores.

Emergency Stocks

The importance of keeping all materials for emergencies in the storehouses or storehouse yards instead of other places cannot be too strongly recommended. With the facilities at its command the store forces are prepared to care for the material and load it at any hour of the day or night for delivery in time for its use. If it is necessary to carry a stock of this material at other locations to protect territory too far away from the general storage point, the material should be carried in the nearest division or local storehouse yard. All emergency rail should be carried at section headquarters, rather than on rail racks along the right-of-way, and the stores should con-



The Chicago, Burlington & Quincy Storehouse at Denver, Colo.

trol all stationery and make physical inspections at intervals to determine if any surplus stock exists.

Rail Laying Supplies Neglected

The committee visited ten large railroads both in Eastern and Western Districts. A number of roads ship their rails to line points, and the fittings and heavy items such as frogs and switch points are shipped either to the general store or the store handling this class of material, although, at the time purchase requisitions are placed a definite program with shipping dates was arranged. The store handling these items then consults with the division engineer to ascertain if he will need the fittings at the time designated. If so, the fittings and frogs are then shipped to the line point. If not, the items are held until needed. This necessitates extra handling at the stores.

Money can be saved if fastenings are shipped direct at the time the rail is disbursed. If the manufacturer could be advised to hold for 30 to 60 days to meet the schedules arranged by the division forces, it would eliminate duplicate handling at the stores and also the necessity of paying for these items until shipped by the manufacturer.

One large railroad made a reduction of over two million dollars during a two years period in controlling line stocks. This was a reduction of 16 per cent of the total material and supplies carried on this road.

The report was signed by W. R. Culver, (chairman) general storekeeper, P. M.; B. T. Adams, assistant general storekeeper, I. C.; R. Bostwick, general storekeeper, C. I. & L.; R. D. Crawford, general storeeeper, I. G. N.; J. C. McCaughan, general storekeeper, H. V.; Arthur Pollard, traveling storekeeper, B. & M.; C. K. Reasor, assistant manager of stores, Erie; E. G. Roberts, division storekeeper, C. R. I. & P.; C. H. Thompson, district storekeeper, S. P.; E. P. Walsh, division storekeeper, C & N. W.; C. B. Hall, (chairman ex-officio) store manager, Penna.

Discussion

Chairman Kyle: The committee advocates that surplus rails be carried at section headquarters rather than scattered along the line on rail racks. I think this should be eliminated as it refers to a practice that devolves on the engineering department.

A. S. McKelligon (S. P.): These rails are a form of material and it is our function to reduce material wherever it is located.

J. G. Stuart (C. B. & Q.): The track motor car has made it unnecessary to carry rails at every mile post. If we do not control our rail rack stocks we can not control other emergency supplies.

L. F. Duvall (A. C. L.): Working stocks are among the most difficult to control. We try to keep them down to two or three days and some times to only one day's supply. There should be almost a daily check-up of these so-called working stocks.

J. C. Kirk (C. R. I. & P.): The committee recommends that all rail and fastenings for rail laying programs should be shipped direct to the work. We tried that plan two or three years ago and found that manufacturers would load in one car, switch material, track bolts and spikes for two or three destinations, and that at the first point the track forces took out a little more material than they were entitled to. We also found that when the switch manufacturers loaded their materials in high-sided gondola cars it was dangerous and expensive for our track forces to unload them. We therefore abandoned the plan, and now require all fittings and switch materials to be shipped to our stores where we reload them with cranes and magnets, so that all material for one job is sent direct to that destination. This practice has been found to be safer, and there is less loss of material.

THE NATIONAL RAILWAYS OF MEXICO have established a freight claim prevention commission over which Carlos G. Renoz, chief of the department of economics of that company, has jurisdiction. The commission is studying the claim prevention methods employed on American railways.

Looking Backward

Fifty Years Ago

The Paris & Danville [now part of the Cleveland, Cincinnati, Chicago & St. Louis] was sold in New York on June 19 under foreclosure proceedings for $335,000. It had a bonded debt of $2,500,000 and extends from Danville, Ill., to Lawrenceville, 103 miles.—*Railroad Gazette*, June 27, 1879.

The conflict between the Chicago & Alton and the Chicago, Burlington & Quincy and the Hannibal & St. Joseph [now part of the Burlington], which had reduced passenger rates between Kansas City and Chicago to 50 cents, has been ended by a compromise, raising the rate to $9.50.—*Railway Age*, June 26, 1879.

Another exciting incident occurred in the Colorado railway war on June 23 when a federal and a United States supreme court judge at Denver decided that the writ under which the control of the Denver & Rio Grande was taken from the Atchison, Topeka & Santa Fe is void. The court then ordered that the Rio Grande be restored to the control of the Santa Fe as lessees. —*Railway Age*, June 26, 1879.

Twenty-Five Years Ago

The Railroad Commission of Texas has issued an order requiring 13 railroads in that state to install a total of 33 interlocking plants at various points on their lines within a period of a year. —*Railway Age*, July 1, 1904.

Henry Miller has been appointed general superintendent of the Missouri district of the Chicago, Burlington & Quincy, with headquarters at St. Louis, Mo., C. H. Markham, general manager of the Southern Pacific, with headquarters at San Francisco, Cal., has also been elected vice-president. Walker D. Hines has resigned as first vice-president of the Louisville & Nashville to engage in the practice of law at Louisville, Ky. —*Railway Age*, July 1, 1904.

"On the freight equipment throughout the country the general supposition is that about 85 per cent of the cars are now equipped with air brakes," George Hannauer, superintendent of the Wiggins Ferry Company, said at a meeting of the Central Association of Railroad Officers at St. Louis, Mo., on June 21. "A recent record taken indiscriminately of about 3,000 cars from every railroad in St. Louis and East St. Louis showed 91 per cent of the cars equipped with air brakes. With this number equipped we should not be more than a year removed from the 100 per cent freight train." *Railway Age*, July 1, 1904.

Ten Years Ago

At a meeting of the executive committee of the reorganized American Railroad Association, which was held in Atlantic City on June 18, R. H. Aishton, regional director of the Northwestern region of the United States Railroad Administration and former president of the Chicago & North Western, was elected president.—*Railway Age*, June 27, 1919.

E. P. Ripley, president of the Atchison, Topeka & Santa Fe, in an address at Chicago on June 12, suggested the relieving of the Interstate Commerce Commission of its power as a solution of the present railroad problem. In its place Mr. Ripley would set up a body of five persons, appointed by the President and holding almost the same relative rank as judges of the Supreme court. They would have absolute legal power over anything presented either by the railroads or by the Commission, and decisions of the Commission might be appealed to them. —*Railway Age*, June 27, 1919.

Communications and Books

Recapture

SHREVEPORT, LA.

TO THE EDITOR:

The recent decision of the Supreme Court in the O'Fallon case has brought forth many and varied predictions as to results. Some have contended that there will be a material increase in railroad rates, others that there would not be much increase. President Hoover has said that there would be no increase.

A study of the situation suggests that if any increase does take place, it will be almost inappreciable.

From my viewpoint, the main benefit that will accrue to the roads will be to some of the prosperous ones, in that the recapture clause of the Transportation Act will be practically annulled, and the earnings in excess of what the Interstate Commerce Commission considers a fair return under existing valuations, will not be divided with the government to be used to help the weaker lines, but will be expended by the roads in betterments or increased dividends to stockholders.

Some of our most prosperous roads have become so not only from good management but, in many instances, from passing dividends for years.

As an example, Southern Railway, if my memory serves me rightly, was, for more than twenty years, not on a dividend basis, the earnings being used to improve the property.

For more than twenty-two years, I was an employee of what was formerly the Q. & C., a part of which is now in the Southern System, and was familiar with its conditions. In 1920 I made a trip from Cincinnati to Chattanooga on a day train, the first time over this part of the road in fifteen years. From the observation car I saw many line changes, some tunnel eliminations, miles of double track and generally, a good, up-to-date railroad. Now, these changes had taken place over a period when the stockholders were getting no dividends, but about 1923 the first dividend was declared, and that system today is on an 8 per cent basis.

The question naturally arises, should the prosperous railroads be penalized by contributing part of their earnings to the roads which are not prosperous? That is what the recapture means.

And, for one, I cannot see any justice in the recapture clause of the Transportation Act. Why should not "every tub stand on its own bottom?"

LINTON W. STUBBS.

Water Circulation in Steam Locomotive Boilers

CHICAGO, ILL.

TO THE EDITOR:

There is no doubt of the value of a complete cycle of circulation of the water in all locomotive boilers, whether large or small, to enhance the evaporation rate and control the range of temperature of the boiler structure during firing-up, and throughout the service period of the locomotive.

To establish authoritatively the rate of velocity of circulation of the boiler water as produced by the installation of Nicholson Thermic Syphons, the matter was referred to Purdue University, stating a definite example of a locomotive having three syphons with 92 sq. ft. of heating surface. The analysis of Professor G. A. Young, head of the School of Engineering, follows:

"Circulation of water in a boiler is more dependent upon the displacement of the water by gravity than upon the temperature. It is true that variations in the weight of water in different parts of the boiler are due to the differences in temperature of the water, and, if in one place, in the natural path of circulation of water in the boiler, a greater amount of steam is formed, the circulation is increased, due to the rapid displacement by gravity.

"The above statements are verified by determining the amount of water which must pass through the necks of the syphons under normal conditions and in the passing create a positive circulation in a locomotive boiler. The area of each syphon neck, 6.25 in. in diameter, is .215 sq. ft., and for the three syphons in .645 sq. ft. Assuming that 55 lb. is evaporated per hr. per sq. ft. of heating surface in the syphons, and that all this water is evaporated into steam and replaced by water, from the forward section of the boiler, a total of

$$55 \times 92 \times 2.118 \text{ or } 10{,}700 \text{ cu. ft. per hr.}$$

would pass out of the syphons in the form of steam. In the above, 92 is the area of the syphons in sq. ft. and 2.118 is the volume of 1 lb. of steam in cu. ft. at the boiler pressure. The velocity of the water in ft. per sec., to replace this steam evaporated in the syphons, under above conditions would be:

$$\frac{10{,}700}{3600 \text{ by } .645} \text{ or } 4.61 \text{ lin. ft. per sec.}$$

through the neck portion of the syphons.

"It is believed that the introduction of the syphons in a locomotive boiler does create a more rapid displacement, especially when these syphons are placed in the natural path of circulation of the water."

C. A. SELEY,
Consulting Engineer, Locomotive Firebox Company.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Motor Carrier Regulation in the United States, by John J. George. 266 p. Pub. by Band & White, Spartanburg, S. C., $3.50.

R. A. O. A. Overcharge and Agency Relief Claim Rules, 1930 Edition. Effective June 1, 1929. 134 p. Pub. by Railway Accounting Officers Association, Washington, D. C., $1.00

Summary of Statements Showing Results of Recapture Examinations of Accounts of Class II and Class III Steam Roads or Recapture Periods Indicated and Cost Thereof, by U. S. Interstate Commerce Commission. 45 p. Pub. by U. S. Govt. Print. Off., Washington, D. C.

Periodical Articles

Analysis of Votes of Present Members of I. C. C. on Railway Unification, by Benjamin Baker. Table showing "voting record" p. 1029. Annalist, June 7, 1929, p. 1029-1030.

A Battle Royal in Railroads—The Part Being Played by the Van Sweringens, by J. H. Lewis. Suggests possible consolidation developments in next four years. Barron's June 17, 1929, p. 3, 8.

Northward the Course of Industry, by Charles O. Smith. "Pioneering railway lines" [in Canada], p. 293-294. Magazine of Wall Street, June 15, 1929, p. 292-294, 340-344.

Some Colonization Projects of the Northern Pacific Railroad, by Harold F. Peterson. Plans and efforts in early days in Minnesota. Minnesota History, June 1929, p. 127-144.

Transport Developments in 1928, by R. Bell ". . . this review . . . will occasionally touch on events of recent date which were the fruit of spade work done last year." p. 395. Public relations, American railways and the I. C. C., road transport services, electrification, coal transport and "the railway outlook" are the main topics. Journal of the Institute of Transport, June 1929, p. 395-403.

Valuation Theory as Applied to United States Railroads, by W. A. Orton. Developments in the post-war years. Economic Journal, June 1929, p. 226-236.

Odds and Ends of Railroading

All in the Family

Three brothers in the employ of the Great Western (England) work at the same station in the same grade, and in the same signal-box. They are T. G., S. J. and D. J. A. Oakhill, who are all signalmen at Cattybrook Box, Pilning, near Bristol. They take successive turns of duty throughout the 24 hours of the day.—Evening News, London.

2,600,000 Miles Without An Accident

Two million six hundred thousand passenger miles without a mishap to passengers or self is the record of Conductor C. S. Morrison of the Winston-Salem division of the Southern. He is now 65 years old and has been in railroad service since 1880. During the half a century he has been railroading he has never had a reprimand or demerit. That is a record that is hard to equal and one of which Captain Morrison may be justly proud.

Women in the Supply Trade

To Mrs. D. Boyle, of San Francisco, belongs the distinction of being one of the few railway supply saleswomen in the country. Mrs. Boyle is the widow of Ed Boyle, who was well-known in the supply trade. She is Pacific Coast representative for the Pilot Packing Company, of Chicago. Another member of the fair sex, who is active in the supply field, is Miss Helen Heller of the American Ditcher Company, who is usually in attendance at the N. R. A. A. show at the Coliseum each year.

Railroad Gives Land For Church

Through General Manager W. G. Templeton, the Nashville, Chattanooga & St. Louis has donated a lot 300 feet square on the highway and main street leading from the highway to the business section of Hollow Rock, Tenn., to the Prospect Baptist church as a site for the erection of a new church building. This church, originally of frame construction, has been twice severely damaged by wind storms, hence the intention of the congregation to change its site, and also to rebuild the edifice with brick.

Fish Killed by Railroad Wreck

Thousands of fish were killed as a result of a train wreck near Amherst, N. S., when ten freight cars left the rails at the headquarters of the Wallace river at Wentworth, and a drum of creosote was broken and its contents spilled into a small rivulet. The rivulet carried the substance, poisonous to fish, into Wallace river. The effect upon trout, salmon and eels was disastrous. Dead fish lay along the banks of the river for three or four miles, and hundreds of gulls came inland from the salt water to devour them.

Russian Steel Finally Moves

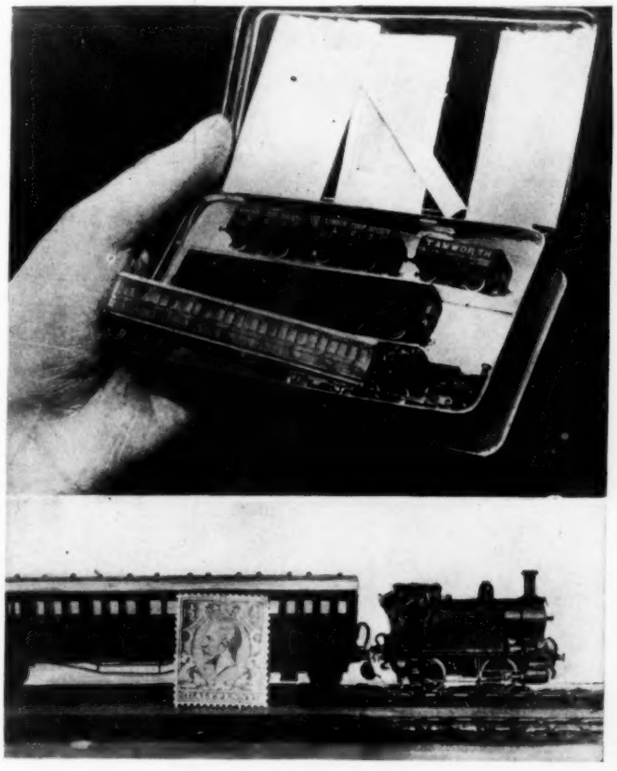
Thirty thousand tons of Siberian railway material will shortly make its first journey towards the Orient. This material, stored for the past 13 years in the Canadian Pacific Coquitlam yards at Vancouver, was a reminder of the revolution in Russia. This is a shipment of approximately 60,000 tons. One half was delivered prior to the outbreak, while the balance was on its way, being automatically stopped when news of Russia's condition was known. The first movement of this steel is going forward on the S. S. Alabama Maru and 1,500 tons is now being loaded for shipment to Japan.

Head First or Feet First

There is more than mere habit behind the practice of making up sleeping car berths so that the occupant sleeps with his head toward the engine and the direction in which the train is moving, according to Walter Pratt, general manager of hotels and sleeping and dining cars of the Canadian National. But because the practice has prevailed ever since the beginning of railroading on the North American continent, it is a custom which has taken on undue importance in the public eye. There is more than one case on record on the Canadian National where an entire sleeping car has had to be made over to satisfy the whims of travelers in this regard. When the first sleeping car was put in service, the company had to decide the elementary question of which way the passenger would sleep, with his head, or with his feet pointing forward. The former attitude was chosen because it was felt that any backward rush of blood which might be occasioned by the movement of the train would be felt less if directed toward the feet rather than toward the head. While it may be problematical whether any such rush of blood is brought about, details such as this are the basis of many well formed human habits. The increasing use of the single room, or "chambrette" car, in which the sleeper's body is carried at right angles to the motion of the train, is not apt to interfere with popular prejudice in this connection, as, in this instance, there can be no question of the flow of blood being encouraged to any one portion of the body by the progress of the car.

Smallest Working Scale Model Railway

One of the most novel exhibits at the Model Engineering Exhibition, held recently in London, was the smallest working scale model railway in the world. It has been made by J. J. Landridge of the Wimbledon Model Railway Club. It is a per-



World's Smallest Railway

fect scale model made at the scale ratio of 2 mm. to one foot. It is only one-half an inch high at the tallest part and runs on a ¾ inch gage. It works by electricity from a small motor housed in the tiny engine.

The Southern Pacific's "Sunset Limited" near Redlands, Cal.

JOHN F. GALVIN of New York was re-elected chairman and Frank C. Ferguson of East Orange, N. J., vice-chairman of the Port of New York Authority at the annual meeting held on June 12.

STEAM RAILROADS in Wisconsin are authorized to own and operate motor coaches and engage in air transportation under the provisions of a bill signed by the governor of that state.

PRESIDENT HOOVER on June 18 announced the appointment of an Interoceanic Canal Board of five members, headed by Major General Edgar Jadwin, chief of engineers of the Army, to make an investigation and survey of the proposed canal across Nicaragua.

VETERAN EMPLOYEES of the Union Pacific held their annual old-timers' reunion at Salt Lake City, Utah, on June 21 and 22. There was on exhibition a train which was composed of a locomotive and cars that were in service 50 years ago. A veteran engineman, 89 years old, was at the throttle.

MECHANICAL DEPARTMENT EMPLOYEES on the Chicago, St. Paul, Minneapolis & Omaha and the Lake Superior & Ishpeming have been granted a wage increase of five cents an hour. On the Omaha, coach cleaners and those mechanics who are paid upon a monthly basis, have been granted time and one half for Sunday and holiday work.

The Southern Pacific has been awarded a judgment of $1,007,000 by the United States Court of Claims as compensation for its services in preventing a flood in the Imperial Valley of California in 1907. When the Colorado river threatened to overflow the valley, the railroad responded to a request of President Roosevelt for cooperation in closing a break in the bank of the river. The railroad's original bill for services was $1,200,000 while the government claimed that a just compensation would be $867,000.

New York Railroad Club Outing

The New York Railroad Club will hold its annual outing at the New York Athletic Club, Travers Island, on July 11. Features of entertainment include a mimic circus, various side shows, contests, a parade and such sports as golf, tennis, swimming, quoits and baseball. A special train will leave Grand Central Terminal, New York, at 12 noon (daylight saving time) for the accommodation of those who attend.

The Union News Company at Buffalo

H. P. Hemmingford, general manager of the Union News Company, announces that in the new passenger station of the New York Central at Buffalo, which opened on June 23, his Company will operate a complete, modern and varied aggregate of shops. The fixtures will be of modern design, to harmonize architecturally with the new station, and there will be not only news stands, but a drug store, a men's furnishing shop, a gift shop, a book store, a toy store, a flower shop, a refreshment spa, a candy shop and boot blacking stands.

U. S. Army Reserve Corps—Railway Units

Sidney Verable Rowland, division superintendent, Chicago Great Western, with headquarters at Chicago, Ill., has been appointed major, Engineer Reserve.

Harry Smith Phillips, superintendent of personnel and safety, St. Louis-Southwestern, with headquarters at Tyler, Texas, has been appointed major, Engineer Reserve.

Frank Osborne Fernald, district superintendent, the Pullman Company, with headquarters at Dallas, Tex., has been appointed captain, Engineer Reserve.

Arthur Rogers Mielly, assistant industrial commissioner, Southern Pacific Lines in Texas & Louisiana, with headquarters at Harlingen, Tex., has been appointed first lieutenant, Engineer Reserve.

Yard Men Sent to Prison

A switching crew of the Pennsylvania at the Union Station, Chicago, have been sentenced to Leavenworth Penitentiary on pleas of guilty to stealing $50,000 worth of goods from the mails during a period of two years. The fireman, who been assigned to the crew for only two months, confessed to the crime and implicated the others. The crew made a practice of running into the Van Buren street parcel post station where they loaded sacks of mail on to the locomotive. They sorted the mail on some vacant track and burned in the locomotive firebox what was not wanted. The engineman, Joseph Pashke, and the conductor, Race F. Malone, were each given a prison sentence of four years and a fine of $2000, while Arthur Scherger, the fireman, was sentenced to a year and a day.

Women's Aid, P. R. R.

The Women's Aid of the Pennsylvania, in its annual report just issued, shows a membership of 197,444, a number more than equal to the number of employees on the company's pay rolls. During the year these workers, chiefly wives, daughters, mothers and sisters of employees, visited 32,307 railroad families, and gave aid to 9,998 families. In carrying on the work of the Aid during the year there was expended $194,203, of which $140,345 is classed as expenditures for relief. At the Christmas season, the work done was the greatest in the history of the organization, 3,345 families being visited.

The president of the Women's Aid is Mrs. W. W. Atterbury, wife of the president of the road; and other officers, both general and district, correspond to the officers of the road; that is to say, a superintendent's wife is usually the superintendent of the Aid for that division.

Committee to Investigate Crossing Accidents

The committee on grade crossings and highway intersections of the National Conference on Street and Highway Safety has announced a comprehensive investigation to be undertaken by the committee during the coming months of the cause and remedies for the large number of accidents at railway grade crossings and highway intersections. This was announced by W. R. Dawes, vice-president of the Central Trust Company, Chicago, chairman of the committee, at a meeting in Washington on June 20.

Four subcommittees have been named (a) protective measures as shown by statistics, (b) methods for reduction of physical hazards, (c) signs, signals, and other protective devices, (d) uniform rules of the road. It is hoped that through this effort, in which Secretary

Lamont has been assured of the cooperation of the national association dealing with the different phases of this problem, that the way may be laid for widespread understanding and adoption of practical measures.

New Equipment On Order

Freight cars on order on June 1, by the railroads of this country totaled 40,484, as compared with 20,712 on the same date last year, according to reports received from the carriers by the Car Service Division of the American Railway Association. On May 1, this year, 44,429 freight cars were on order. Of the cars on order June, there were 17,630 box cars, an increase of 8,145 compared with the same date last year, and 19,111 coal cars, an increase of 14,523 compared with the number of such cars on order on June 1 last year. Reductions, for the most part small, were reported in the number of refrigerator and other kind of freight cars on order this year compared with one year ago, except Stock cars which showed a slight increase.

Locomotives on order on June 1, this year, numbered 324 compared with 113 on the same day in 1928.

New freight cars placed in service in the first five months of 1929 totaled 26,041 of which box cars totaled 11,817; coal cars 8,844; flat cars, 1,892; refrigerator cars 2,751 and stock cars 673. Sixty-four cars of other classes were also installed.

New locomotives placed in service in the first five months of 1929 totaled 255.

Freight cars or locomotives leased or otherwise acquired are not included in the above figures.

"Fixem's First Aid Fables"

"Fixem's First Aid Fables" is the title of a series of radio lessons in first aid to the injured recently sent out by Station WLAC, Nashville, Tenn., and they are said to have proved very popular. They are the work of George C. Howard, chief clerk in the Superintendent's office of the Louisville & Nashville at Nashville, whose ventures in this kind of publicity have been mentioned in previous issues of the *Railway Age*. His lesson on safety at highway crossings, entitled "The Lawbreaker," which was a radio drama, was noticed in the issue of May 25, page 1224.

"Mr. Fixem" gives instructive lectures on first aid lasting from 15 to 30 minutes, the serious matter being interspersed with music and humor sufficient to keep his audiences well entertained. The Life & Casualty Insurance Company, of Nashville, which operates station WLAC, has organized the "Junior Safety Club" and offers a prize to boys and girls under 16 years of age who listen to the radio lectures and who send in letters by which their attentiveness can be measured; and on the examination of the papers and the selection of the best one, the writer of that one will be given a trip on the "Pan American" express of the Louisville & Nashville from Nashville to Bowling Green and back, including a first-class meal in the dining car.

The Waynesburg & Washington

THE WAYNESBURG & WASHINGTON, a three-foot gage line of the Pennsylvania, extending from Waynesburg, Pa., northward to Washington, 28 miles, and which, according to the Official Guide, has two passenger trains each way daily, except Sunday, is going out of the passenger business. Announcements have been posted at the stations to the effect that train service will cease on July 10, in accordance with a decision of the Public Service Commission of Pennsylvania.

The Pittsburgh *Post-Gazette*, reporting the feelings of the people of Waynesburg says:

"This sleepy countryside is about to lose its most colorful institution, the Waynesburg & Washington railroad, a loyal friend for 53 years, but only the butt of ridicule in this modern day of good roads and fast motors. On the tenth of next month the coaches will roll for the last time over the three-foot tracks, climb the steep, winding grade and twist around hair-pin curves into the oblivion reserved for the cast-off things of progress. And Greene county, now bedecked with ribbons of highway for fast motor transport, is apathetic to the fate of the railroad, once its only connecting link with civilization. Orginally there were several trains a day between the two terminals. At one time there were eight."

Memorials to General W. J. Palmer

A bronze bas-relief tablet in memory of Gen. William J. Palmer, who for 31 years was president of two of the railroads that now comprise the Denver & Rio Grande Western, was unveiled at the Union Station of that railroad and the Western Pacific at Salt Lake City, Utah, on May 28. Presentation of the tablet, which is the gift of George F. Peabody, of New York, was made by George H. Dern, governor of Utah. Philo T. Farnsworth, Jr., attorney for the Western Pacific for Utah, accepted the memorial for the railroads.

Similar memorials to Gen. Palmer have been placed at Denver and Colorado Springs, Colo., and Mexico City. The Denver tablet is in the Union Station and was unveiled on February 12. It is reproduced in the accompanying illustration.

Opening of New Station at Buffalo

The new passenger station of the New York Central at Buffalo, N. Y., which has been under construction for the last three years and which was described and illustrated in the *Railway Age* of May 18, page 1147, was opened for service on Sunday, June 23, and was the scene of an elaborate celebration on the afternoon of Saturday, preceding. An incident of the celebration was the departure of the Empire State Express, eastward, from the new station at 2:10 p. m., though no other business was done until after midnight.

The main feature of the celebration was a luncheon in the grand concourse of the station given by the Buffalo Chamber of Commerce, the number of persons in attendance at this function being about 2200. Among those in attendance, besides many officers of the New York Central, representatives of the state and city governments and varied mercantile interests, were officers of the Pennsylvania, the Erie, the Canadian National, the New York, Chicago & St. Louis, the Buffalo,

Courtesy of J. Keating, general manager, Union Terminal, Denver.

Rochester & Pittsburg, and the Buffalo & Susquehanna. William H. Fitzpatrick, chairman of the commission which, under the authority of the state, had participated in this improvement, made the opening address, and Sir Henry Thornton, president of the Canadian National, spoke briefly; the principal speaker was P. E. Crowley, president of the New York Central.

The trains of the Pennsylvania use the new station and this company in an advertisement in the Buffalo Courier Express, conveys the congratulations of that road to the New York Central.

Mr. Crowley in his address, said, in part:

"The station building on Exchange street was constructed in 1870 and enlarged from time to time, but for many years it had been unsatisfactory to the people of Buffalo. Several commissions and committees were appointed and plans were prepared for a new passenger station, but no progress was really made until 1911, when the Railway Terminal Station Commission was created by an act of the legislature, and members were appointed by the Governor. Progress was interrupted by our entry into the War, but the question was attacked anew in 1920... It was not until 1925 that the site upon which the present station is erected was selected and was determined upon. We are doing much more than merely throwing open for public use the most modern facility of its kind. We are celebrating the erection of a monument to complete the cordial co-operation; co-operation between public authorities and private interests; between civic pride and private enterprise... Many eminent citizens of Buffalo have contributed their services and their advice, and I cannot too highly praise the untiring efforts, the civic spirit and the cordial and helpful assistance given to the railroad officers by the members of the Terminal Station Commission, over which William H. Fitzpatrick and William E. Robertson, have so ably presided as chairman and vice-chairman, respectively... It has been my privilege to be concerned in all the negotiations with the terminal and the city authorities, and it has been a pleasure to work with them.

...I regard it as one of the highest privileges that has come to me during my life to be able to say to you to-day that this completed station is now open for public use; that it could not have been planned and completed without co-ordination of effort on the part of everyone interested, railroad representatives, terminal commission members, His Honor, Mayor Francis X. Schwab, and the other officers of the City of Buffalo. We hope and believe that our relations will continue and will grow even closer and that the occasion of to-day will mark the beginning of an epoch of greater cordiality and greater friendliness."

Following the luncheon, Mr. Crowley, Chairman Wm. A. Prendergast of the New York Public Service Commission and other speakers, made brief radio addresses.

Music was furnished throughout the celebration by the Avis Band, which is composed of men from the shops of the New York Central at Avis, Pa.

Traffic

The Grand Trunk-Canadian National has re-equipped its International Limited running between Chicago and Montreal. There is a solarium observation lounge car equipped with individual radio receiving sets, and each train has individual seat coaches.

The Supreme Court of California has sustained a ruling made by the Railroad Commission of California abolishing the fee charged shippers for each freight car switched from one line to another at junction points. A writ of review sought by the railway was denied.

The new line of the Chicago, Rock Island & Pacific between Liberal, Kan., and Amarillo, Tex., will be opened to through traffic on July 15. Between 100,000 and 150,000 acres of prairie tributary to this line in the Panhandle of Texas will now be brought under cultivation for the first time.

Two traffic officers of the Pennsylvania, H. M. Phillips, foreign freight agent, and Henry Opperman, Jr., foreign passenger agent, have been exploring the business world of South America, and a booklet, beautifully illustrated, has been issued by the railroad, telling of what they saw and did in the 13,000 miles that they traveled.

A total of 1,564 carloads of strawberries has been shipped from points along the Missouri Pacific Lines as the season draws to a close this year against 1,434 carloads in 1928. The Arkansas division shipped 1,098 carloads; the central division, 225 carloads; the White River division 141 carloads; and the Joplin division, 97 carloads.

The Cleveland, Cincinnati, Chicago & St. Louis and the Michigan Central which established the "Motor Queen" on a seven hour schedule between Cincinnati, Ohio, and Detroit, Mich., on April 28 have since reduced the time to six and one-half hours. The train now leaves Cincinnati at 3:20 p. m. arriving in Detroit at 9:50 p. m. Southbound it leaves Detroit at 3:10 p. m. and arrives in Cincinnati at 9:40 p. m.

Senator Gillett, of Massachusetts, just before the recess of Congress on June 19, introduced a resolution, S. J. Res. 64, authorizing and directing the Interstate Commerce Commission and the United States Shipping Board to make a joint investigation into the practicability of equalizing rail rates and ocean rates on export and import freight traffic between points in the United States and points in foreign countries via the several United States ports, and to make a joint report thereon.

The Interstate Commerce Commission has suspended from June 21 to January 21, 1930, tariff schedules filed by the railroads proposing increases in freight rates on newsprint paper and other paper articles from points in Canada to numerous destinations in the United States. The proposed schedules would have increased the rate on newsprint from Three Rivers, Que., to New York City from 34 cents to 40½ cents per 100 lb., and the rate from Port Arthur, Ontario, to Chicago, from 34½ cents to 48 cents.

Mileage Scale Prescribed for Gravel, Etc.

The Interstate Commerce Commission on June 17 made public its report on its general investigation of rates on sand, gravel, crushed stone, shells and related commodities in the Southwest, Part II of its rate structure investigation under the Hoch-Smith resolution. A mileage scale basis of maximum reasonable rates was prescribed. Undue prejudice was found to exist against persons in interstate commerce and unjust discrimination against interstate commerce by reason of interstate rates between points in Louisiana west of the Mississippi river, including points on both banks thereof, which was ordered to be removed by rates made in relation to the general mileage scale prescribed.

The Waycross & Southern

The Georgia Public Service Commission, according to press dispatches of June 13, has approved discontinuance of regular train service on the Waycross & Southern, a road 20 miles long, on which the total passenger revenue for one year has been $6.72. In the year 1924, the road carried 22,362 passengers. This road, according to a timetable in the Official Guide extends from Waycross, Ga., southeasterly to Hopkins, 20 miles, and thence 30 miles farther to Fargo, though a note at the bottom of the table says that the road is only open for traffic from Hebardville (2 miles north of Waycross) southward to Hopkins; and that the line is under construction for 50 miles. However, this timetable is dated August, 1927. Between Hebardville and Hopkins the table shows one train each way once a week (on Wednesday).

I. C. C. Chairman on Air-Rail Trip

Chairman E. I. Lewis of the Interstate Commerce Commission left Washington on June 23 over the Pennsylvania to be one of the passengers on a preliminary trip over the ocean-to-ocean rail-and-air line via the Pennsylvania, the Transcontinental Air Transport and the Atchison, Topeka & Santa Fe. At Columbus, Ohio, on June 24, transfer was to be made to a T. A. T. plane, which, with stops scheduled at Indianapolis, St. Louis, Kansas City and Wichita, was due at Waynoka, on the Oklahoma-Kansas line at 6:39 p. m. There transfer was to be made to a sleeping car on the Santa Fe for Clovis, N. M., where transfer was to be made back to a plane due to arrive at Los Angeles at 5:52 on June 25.

"The government has not extended our

regulation to the realm of air transportation," said Chairman Lewis, "but all who have to do with transportation are interested in following closely the rapid strides now being made to bring more closely together all parts of this continent. We now seem to have reached the point where persons living on either seaboard can travel to the opposite ocean and visit or transact business in its cities and be back home, all in the space of less than a week. Already express and some freight is being moved by air transport at speeds that practically annihilate space, and we are accustomed to fast air mail. I am particularly interested in this new development because I was one of those under the leadership of Carl Fisher, who pioneered the first transcontinental automobile route. On that trip, less than two decades ago, we took almost a month to go from coast to coast. Seeing what has transpired in so short a time since the opening of the transcontinental highways, can one venture a prediction of what will come in the next ten years or even shorter time, in opening of air routes over this country?"

Trans-Missouri-Kansas Shippers' Board

Approximately 650 representatives of industry, agriculture and the railroads attended the twenty-fourth quarterly meeting of the Trans-Missouri-Kansas Shippers' Board, which was held at Hutchison, Kan. on June 19, and was devoted primarily to the marketing of the winter wheat crop. The preparations of the railroads to meet the heavy seasonal demands placed upon them and of the primary grain markets to absorb the heavy flow of grain from the country during the next 90 days also occupied a large portion of the program. Owing to the increased use of the "combine" this season and with the heavy carryover of the 1928 crop it will be necessary that shippers and receivers promptly load and unload railroad cars and that cars be loaded to their full carrying capacity.

The importance of increased farm storage was discussed by H. M. Bainer, director of the Southwestern Wheat Improvement Association. If the wheat crop is to be successfully marketed, Mr. Bainer said, it is most essential that the winter wheat crop be marketed in a more orderly manner.

B. H. Johnson, chief inspector of the Kansas State Grain Inspection Department, explained his arrangements for inspection of grain this season. Additional samplers, Mr. Johnson said, have been employed at each of the principal grain markets it is possible that samples on about 30 per cent of the total receipts will be delivered to the consignee a day earlier than heretofore.

Business prospects during the third quarter of 1929 are viewed with optimism by the commodity committees. The business outlook in 16 of the 28 principal lines of industry is for an increase in business over a year ago, while 12 lines of industry anticipate a decrease. The reports presented estimate carload requirements during the period mentioned to be 618,318 cars, as compared with 581,059 cars actually loaded during the third quarter of 1928, an increase of 6.4 per cent.

Canadian Tourist Traffic Shows Big Increase

Expenditures totaling approximately $250,501,000 were made in Canada by tourists from other countries during 1928, according to figures recently published by the Dominion Bureau of Statistics. This compares respectively with 1927 and 1926 estimates of $215,763,000 and $186,791,000. Canadian tourists on the other hand are estimated to have spent $103,245,000 in other countries during 1928, $103,782,000 during 1927 and $90,693,000 in 1926. Thus the 1928 excess of expenditures of foreign tourists in Canada over those of Canadian tourists in other countries was approximately $147,256,000. The 1927 and 1926 balances in favor of Canada were respectively, $11,981,000 and $96,098,000.

The importance of this tourist trade in Canada's economic growth, the survey points out, becomes more widely recognized each year. That Canadians realize the economic importance of this traffic, it continues, is evidenced by the large sums spent on highway construction, advertising, hotels, etc.

The study divides the foreign tourist trade of Canada into three classes: Tourists entering Canada via ocean ports; tourists entering Canada from the United States in automobiles; and tourists entering Canada from United States by rail or steamer.

Figures on the first class are obtained from records of arrivals kept by the Department of Immigration and Colonization. The number of tourists entering in this manner decreased slightly in 1928 as compared with the previous year and likewise their estimated expenditures fell approximately $476,000 or to a figure of $10,596,000 from the 1927 figure of $11,072,000.

The most important factor in the tourist business is found to be the automobile traffic between Canada and United States. These travelers, during 1928, are estimated to have spent in Canada $167,384,000 as compared with $134,426,000 during 1927. This increase amounts to $33,000,000, or about 25 per cent. In connection with their balance of payments studies the United States Department of Commerce estimated that these tourists spent about $5,000,000 in 1928 for merchandise brought back with them to the United States

Returns from the principal railway and steamship companies with lines between Canada and United States in 1928 record an increase of 48,000 passengers over 1927 from United States to Canadian points. The total expenditures of these in Canada during 1928 is estimated at $72,521,000 or an increase of $2,267,000 over the 1927 estimate.

The study also divides Canadian tourists to other countries into those leaving via ocean ports, automobile parties to United States and rail and steam traffic to United States. Estimated expenditures of the first class in other countries during 1928 decreased $1,658,000 from the 1927 estimate. The expenditures of automobile parties, as in the case of automobilists from United States into Canada, showed the greatest increase, i. e. $2,753,000 more in 1928 than in 1927. The rail and steamer tourists from Canada are estimated to have spent $1,632,000 less in other countries during 1928 than in 1927. Thus the net decline in 1928 from 1927 is $437,000 bringing the favorable balance accruing to Canada from tourist trade during 1928 to an increase of more than $35,000,000 over the 1927 balance.

This favorable balance, the survey points out, represents an "invisible" export which is surpassed in value only by wheat exports among the leading commodities exported from Canada during the fiscal year 1928-1929.

* * * *

Wide World.

Arrival at Los Angeles of First Passengers To Use Trans-Continental Air-Rail Service of Universal Aviation Corporation, New York Central and Santa Fe

Foreign Railways

Passenger Train Wreck in Belgium

Press dispatches of June 20 report the wreck of a passenger train near Grammont, 21 miles east of Brussels, Belgium, on the 19th, in which 12 persons, most of them passengers, were killed. The account indicates that weakness of roadbed was the cause of the disaster.

Faster London-Paris Service Inaugurated

A new all-Pullman train and boat service to be known as the "Golden Arrow Limited," has been inaugurated between London and Paris by the Southern Railway of Great Britain in conjunction with the Northern Railway of France. Formerly a special Pullman section of the 11 A.M. train from Victoria terminal (London) left at 10:45 a.m., but it was necessary for the steamer to await the arrival of the second section at Dover before leaving for Calais. The new arrangement eliminates the wait at Dover, allowing a through trip from London to Paris in six hrs. 35 mins. The all-Pullman train from London now leaves at 11 o'clock and upon reaching Dover, the passengers proceed at once to the steamship "Canterbury," a new vessel specially assigned to this service. The boat leaves Dover at 12:55 p.m., and reaches Calais at 2:10 p.m. The "Golden Arrow" train then leaves at 2:25 p.m., and is due at Gare du Nord (Paris) at 5:35 p.m. The return train leaves the Gare du Nord at noon, the passengers arriving in London at 6:35 p.m. The result is a gain of 20 minutes on the outward journey from London and of 40 minutes in the return direction.

A number of special Pullman features have been incorporated in the furnishings of the "Canterbury," to add to the comfort of the passengers while crossing the channel. The steamer is reserved exclusively for the passengers of the all-Pullman train.

Italy Institutes Fast Service for Perishable Freight

An accelerated service of trains carrying perishable freight has been introduced in Italy, according to a report to the Department of Commerce. Three of these trains are run daily from Naples, en route to Munich, Berlin, Vienna and other points. It has been estimated there will be a saving in time of about 24 hours in the arrival of merchandise at its destination. The trains, composed of from 20 to 22 cars will travel at the rate of 22 miles per hour instead of the usual average of 12½ miles. A secondary fast service of freight trains will meet these trains at Verona, Castel Bolognese, Lavezzola and Bari, conveying vegetables and fruits for transport by the new fast service trains.

Equipment and Supplies

Locomotives

THE NORTHERN PACIFIC is inquiring for 11 Mallet type (2-8-8-4) locomotives.

PITTSBURGH & LAKE ERIE—See New York Central.

THE WABASH reported in the *Railway Age* of June 22 as inquiring for 25 of the 2-8-2 type locomotives, is now inquiring for an alternate bid on 25 of the 4-8-2 type locomotives.

THE NEW YORK CENTRAL has ordered for service on the Pittsburgh & Lake Erie, 25 heavy type eight-wheel switching locomotives from the Lima Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of June 15.

THE CANADIAN NATIONAL is having the mechanical parts of a 400 hp. oil-electric switching locomotive built by the Canadian Locomotive Company, at Kingston, Ont. An order for the electrical equipment has been given to the Westinghouse Electric & Manufacturing Company; the generator and exciter will be built by the Canadian Westinghouse Company and the oil engine at the Westinghouse South Philadelphia works. The control equipment, blower motors and four traction motors will be built at East Pittsburgh, torque governor control is included.

Freight Cars

THE CARNEGIE STEEL COMPANY has ordered 22 gondola car bodies from the Greenville Steel Car Company.

THE VAN CAMP SAND & GRAVEL COMPANY has ordered two lift door air dump cars of 20 yd. capacity from the Koppel Industrial Car & Equipment Company.

THE LEHIGH COAL AND NAVIGATION COMPANY has ordered seven 30-yd. dual side, pivot, drop-door, air-dump cars from the Western Wheeled Scraper Company.

THE GENERAL CHEMICAL COMPANY is inquiring for 21 tank cars of 50 tons' capacity and 15 tank cars of 75 tons' capacity for carrying sulphuric acid.

THE BRADEN COPPER COMPANY has ordered three narrow gage tank cars of 4000 gal. capacity from the General American Tank Car Corporation.

THE UNITED STATES NAVY DERARTMENT, Bureau of Supplies and Accounts, is inquiring for one tank car for carrying Helium gas.

THE CENTRAL MAINE POWER COMPANY has ordered six lift door air dump cars of 20 yd. capacity from the Koppel Industrial Car & Equipment Company.

THE FEDERAL ENAMELING & STAMPING COMPANY has ordered three lift door air dump cars of 30 yd. capacity from the Koppel Industrial Car & Equipment Company.

THE NORTHERN PACIFIC has ordered 100 flat cars from the Pressed Steel Car Company. This is an increase of a previous order which was for 200 cars from the same builder and reported in the *Railway Age* of May 11.

Pennsylvania Equipment Orders

The Pennsylvania has placed orders for 4000 steel box car bodies to cost approximately $6,400,000. The orders were distributed as follows:

Pressed Steel Car Company	1000 bodies
American Car & Foundry Co.	900 bodies
Ralston Steel Car Co.	800 bodies
Pullman Car & Manufacturing Corporation	700 bodies
Standard Steel Car Company	600 bodies

The new bodies will be built for the Class X 29 all steel standard Pennsylvania box cars. They will be 40 ft. 6 in. long with a capacity of 100,000 lb. Trucks will be provided by the railroad from equipment already at its disposal. When completed, the new equipment will go into general service, making possible the retirement of older and smaller cars. It is expected that the new cars will be placed in operation in time for the heavy fall business. These orders are part of the Pennsylvania's program of improvement and expansion in every phase of its operation, to take care of the rapidly growing demand of the public for transportation service. In addition, the Pennsylvania has ordered from its Altoona shops 50 standard Pennsylvania Class N-5 caboose cars and 25 horse express cars, Class B-74-B, and a contract has been given to the Koppel Industrial Car & Equipment Company for 30 air operated dump cars of 30 yd. capacity each.

Passenger Cars

PENNSYLVANIA—See item under Freight Cars.

THE ERIE is inquiring for five gas-electric rail motor cars.

THE DETROIT, TOLEDO & IRONTON is inquiring for three oil-electric rail motor cars.

Iron and Steel

THE UNION PACIFIC is inquiring for 1,000 tons of structural steel for a passenger station at Omaha, Neb.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 500 tons of structural steel for remodelling its passenger station at Omaha, Neb.

THE ERIE has ordered 500 tons of steel from the American Bridge Company for a bridge at Corning, N. Y.

THE SOUTHERN PACIFIC has ordered 240 tons of structural steel for a machine

shop at San Francisco from the Consolidated Steel Company.

THE SOUTHERN PACIFIC has divided orders for 33,864 tons of rails among the Tennessee Coal, Iron & Railroad Company, the Colorado Fuel & Iron Company and the Bethlehem Steel Company.

THE DELAWARE, LACKAWANNA & WESTERN is asking for bids on June 24 for about 4,000 tons of structural steel work for the necessary overhead bridges in connection with its electrification programs.

THE PENNSYLVANIA has ordered 1000 tons of steel from The McClintic-Marshall Company. This is to be used in connection with its electrification work between Trenton and Philadelphia.

Machinery and Tools

THE NEW YORK CENTRAL is inquiring for a quartering machine.

THE MISSOURI PACIFIC has ordered a one-ton motor driven crane from H. D. Conkey and Co.

THE CLEVELAND UNION TERMINAL COMPANY is inquiring for 25 machine tools for its electric locomotive repair shops.

THE CENTRAL OF NEW JERSEY has ordered one standard double axle lathe and one car axle burnishing lathe from Manning, Maxwell & Moore, Inc.

Signaling

THE TEXAS & PACIFIC has ordered from the General Railway Signal Company 18 color-light automatic block signals, type D, which, with other material will be installed near Addis, La.

THE READING has ordered from the General Railway Signal Company a dwarf interlocking machine, style D, to be installed at Oley street, Reading, Pa.

THE CANADIAN PACIFIC has ordered from the Union Switch & Signal Company material for an interlocking at Farnham, Que.

THE CHESAPEAKE & OHIO has ordered from the Union Switch & Signal Company an electro-pneumatic interlocking for HO Cabin, Huntington, W. Va., 36 working levers.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the General Railway Signal Company material for an electric interlocking, 25 working levers, to be installed at Barstow, Cal.

THE ERIE has ordered from the Union Switch & Signal Company material for automatic signals to be erected at 87 highway crossings. The order includes 58 flasher relays, style NF, 185 color-light signals, 395 relays and other material.

THE BINGHAM & GARFIELD has ordered from the General Railway Signal Company a G. R. S. dispatching system, to be installed between Arthur Junction, Utah and Bingham, 16 miles. The dispatching machine will have 17 working levers.

Supply Trade

Herr Becomes Vice-Chairman, Merrick President of Westinghouse Electric

F. A. Merrick, vice-president and general manager of the Westinghouse Electric & Manufacturing Company has been elected president, with headquarters at Pittsburgh, Pa. In announcing the election of Mr. Merrick to the presidency of the company, A. W. Robertson, chairman, stated that the board of directors in accepting the resignation of E. M. Herr, president since 1911, in order that he might go on an extended vacation, had elected him vice-chairman.

F. A. Merrick was born in New Jersey and received his technical education at Lehigh University. Shortly after his graduation, he was employed by the Steel Motors Company, a subsidiary of the Lorain Steel Company, where he was responsible for many important electrical inventions and where he held the position of manager and chief engineer. On the acquisition of the Steel Motors Company by the Westinghouse Company, Mr. Merrick entered the Westinghouse organization. He was selected to prepare plans for a plant in Canada and upon the formation of the Canadian Westinghouse Company, Ltd., in 1903, was appointed superintendent of the Canadian company. He was then successively manager of works and later vice-president and general manager of Canadian Westinghouse Company, Ltd.

During the World War, Mr. Merrick was assigned to organize the operations of the New England Westinghouse Company, located in Chicopee Falls, Mass., to manufacture rifles for the Russian government, and when the United States entered the war to supply war material for the American government.

Mr. Merrick, although required to reorganize and largely re-equip this factory to fulfill American war contracts, completed an order for 60,000 Browning machine guns within 11 months after operations were begun. After the war, Mr. Merrick was located in London, England, for two years as special representative of the Westinghouse Electric International Company, after which he returned to Canada to resume his duties as vice-president and general manager of the Canadian Westinghouse Company, Ltd.

In January 1925, he became vice-president and general manager of the Westinghouse Electric & Manufacturing Company, with headquarters at East Pittsburgh, Pa. In June 1925, he was also elected a director of the company.

Edwin M. Herr, the new vice-chairman, was born in Lancaster, Pa., on May 3, 1860, and after attending public schools he served as telegraph operator on the Kansas Pacific (now a part of the Union Pacific) and later became station agent. In 1881 he entered the Sheffield Scientific School of Yale University and was graduated in 1884. He subsequently served in the office of the mechanical engineer of the Chicago, Burlington & Quincy at Aurora, Ill., and then as a mechanical draftsman, later becoming successively engineer of tests, superintendent of telegraph and finally division superintendent of that road. In 1891 he was appointed division master mechanic of the Chicago, Milwaukee & St. Paul and two years later he went to the Grant Locomotive Works as general superintendent at Chicago.

In 1894 he became general manager of the Gibbs Electric Company of Milwaukee and on the dissolution of this company shortly thereafter, Mr. Herr visited Europe in order to inform himself of foreign railroad practice. On his return to America he went back to railroading and in 1895 he was appointed assistant superintendent of motive power of the Chicago & North Western and, one year later, superintendent of motive power of the Northern Pacific.

In 1898 he became general manager of the Westinghouse Air Brake Company, at Wilmerding, Pa., remaining with that

F. A. Merrick

Edwin M. Herr

company until 1905 when he was elected first vice-president of the Westinghouse Electric & Manufacturing Company, when this company entered a receivership in 1907 Mr. Herr served as one of the receivers and general manager. About a year later when the company was reorganized, Mr. Herr resumed his former position with the company and in 1911 he was elected president. During his management of the company its business increased from about $20,000,000 annually to about $200,000,000 annually. During a visit to Japan in 1920, Mr. Herr was decorated by the Emperor of Japan with the Order of the Rising Sun in acknowledgment of his co-operation in training Japanese students at the Works of the Westinghouse Company. Mr. Herr has always been interested in educational matters and has devoted much of his time to developing an educational system for employees of the company. He is a member of the Yale (University) Corporation and of the committee in charge of finance of that institution. He is a director of the American Manufacturers' Export Association, Radio Corporation of America, Westinghouse Air Brake Company, Westinghouse Electric & Manufacturing Company and various other organizations.

The **Texas Creosoting Company**, Orange, Texas, has purchased the plant of the Houston Wood Preserving Company, Houston.

J. A. Amos has been elected vice-president in charge of the sales and service of the **Pyle-National Company**, Chicago. **Geo. E. Hass** has been appointed assistant to Mr. Amos.

Douglas W. Dodge has been appointed San Francisco representative of the **American Car & Foundry Company** with office in the Rialto building, San Francisco, Cal.

Charles B. Royal, Chicago district manager of the Galena Signal Oil Company prior to its dissolution is now associated with the **Standard Oil Company** of Indiana.

The **Austin Company**, Cleveland, Ohio has organized the Austin Company of Texas, to handle engineering projects in the southwest district. The new company's territory includes, Texas, New Mexico, Oklahoma, southern Arkansas and western Louisiana.

H. B. Miller, formerly manager of the branch office of the **Truscon Steel Company** at Pittsburgh, Pa. has been elected as vice-president and general manager of the Pacific coast plant and is succeeded by **W. H. Kelly** of the Chicago office.

The Linde Air Products Company, New York has opened a new plant at 2603 Floyd street, Louisville, Ky., to produce oxygen to supply the local demand. **R. Frye** is superintendent of the new plant and **W. L. Potts**, with headquarters at the Cincinnati plant, is district superintendent.

McLeod Thomson, for many years district sales agent of the **Rail Joint Company**, with headquarters at Philadelphia, Pa., has resigned effective July 1. **Milton Markley**, who has been associated with Mr. Thomson for a number of years will continue to represent the Rail Joint Company in the Philadelphia territory.

General Electric Company

The General Electric Company, Schenectady, N. Y., has reorganized its railway engineering department which in future will be known as the transportation engineering department. H. L. Andrews is now engineer of the department; W. B. Potter has been appointed consulting engineer, with A. H. Armstrong and W. J. Davis, Jr., as associates and consulting engineers. Included in and as divisions of the transportation engineering department will be the railway equipment, the air-brake equipment and the industrial locomotive engineering departments at the Erie, Pa. works, and the automotive engineering department at the Lynn, Mass., river works.

H. L. Andrews, engineer of the new department was born in Boonville, Mo. He was graduated from the University of Missouri in 1910 with the degree of B. S. in electrical engineering. In August of that year he entered the testing department of the Schenectady works of the General Electric Company and was made assistant head of the floor test the following year. In May, 1912, he was transferred to the railway motor department, and in 1916 joined the railway engineering department. A year later he was placed in charge of car equipment. Late in 1925 he was appointed engineer in administrative charge of the department.

W. B. Potter is a native of Connecticut. He went with the Thomson-Houston Company at Lynn, Mass., in June, 1887, and became interested in electric railways, his first work in that field was construction work installing equipment for the West End Railway of Boston. In 1890 he entered the engineering department. In connection with a study of electric railway equipment, in 1892 Mr. Potter conceived one of his most important inventions, the series parallel controller which since has been used extensively in control for electric railway motors. Mr. Potter continued in the department after the absorption of the Thomson-Houston Company by the General Electric Company and in 1895, he was made chief engineer. Mr. Potter had been identified with a number of railroad projects in the States and in foreign countries. More than 130 patents have been issued to him for various inventions.

Albert Horace Armstrong, assistant engineer of the railway department, was born at Worcester, Mass. He was graduated from Worcester Polytechnic Institute in the engineering course in 1891 and entered the employ of the Thomson-Houston Company at Lynn in the same year. His first work was on the design of induction motors and alternating current generators, and in 1892, when the General Electric Company was organized, he went to Schenectady to work on general alternating current design. In 1897 he entered the railway engineering department and has since devoted most of his time to the study of railway problems. In addition to an extensive study of interurban and heavy traction work, Mr. Armstrong has taken part in the engineering study connected with various steam road electrifications. For many years he served as assistant engineer of the railway engineering department, and chairman of the electrification committee of the company.

W. J. Davis, Jr., is a graduate of the Rose Polytechnic Institute, and began his work with the General Electric Company in the testing department upon graduation in 1892. He was later placed in charge of the calculating room of the testing department. He then served in the railway department and carried out a great deal of special engineering work in connection with the Detroit River Tunnel electrification, and other railroad electrification. He introduced forced ventilation for railway motors and made an exhaustive study of the subject of train resistance. In 1908, he became Pacific Coast engineer, with headquarters at San Francisco, and spent many years on engineering and development work of all kinds in that territory. In February, 1921, he was transferred to the railway engineering department at Schenectady.

Obituary

Oliver Ames, senior member of the board of directors of the General Electric Company, died at his home in North Easton, Mass., on June 18. Mr. Ames was 65 years old and had been a member of the board since 1893.

Trade Publications

THE GENERAL RAILWAY SIGNAL COMPANY is now 25 years old and has celebrated the date (June 13) by issuing a modest silver-covered booklet of eight pages combining a few bits of history with some very up-to-date information about its business. The pictures range from the original buildings of 1904 and the first A. P. B. signaling, to the new Buffalo station and the latest car retarders and dispatcher control machine.

CALYX DRILLS:—A well-illustrated and informative catalogue of 43 pages has been issued by the Ingersoll Rand Company, New York, covering its line of Calyx core drills, used for determining the character, order, thickness and extent of materials below the earth's surface by means of cylindrical cores which the drills extract. The catalogue includes numerous illustrations of drilling operations and drill equipment, together with the essential details of the various sizes of drills and a general description of their operation.

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract has been let to Lungden and Carlson, Topeka, Kans., for the construction of 11 warehouse buildings and storage sheds at Emporia, Kans.

BOSTON & MAINE.—This company has submitted plans to the New York Public Service Commission for the elimination of four grade crossings on its lines in the village of Scotia, N. Y. Two plans were presented, one to provide overcrossings for two of the highways and a bridge to care for the traffic of the other two. The cost of this plan has been estimated at $348,000. The second plan was to depress the railroad tracks, thereby reducing the height of the approaches to the overpasses, at an estimated cost of $492,000.

CENTRAL OF GEORGIA.—A contract has been awarded to M. H. Gardner, Columbus, Ga., for grading work in connection with the relocation of one and one-third miles of main track on this company's lines west of High Bluff, Ala. The project will cost about $45,000.

CHESAPEAKE & OHIO.—A contract has been awarded to the West Virginia Construction Company, Huntington, W. Va., for the construction of an undergrade crossing on this company's lines in St. Albans, W. Va., to cost approximately $110,000. A contract also has been let to Board & Board, Charleston, W. Va., for the construction of an undergrade crossing at Miami, O., at an estimated expenditure of $112,500.

CHESAPEAKE & OHIO.—This company has awarded a contract to the John W. Cowper Company, Richmond, Va., for the construction of a new hospital building at Huntington, W. Va., to cost approximately $230,000. The new structure, which will front on Sixth avenue, will be of fire-proof construction, with reinforced concrete frame and brick walls. It will be of Colonial design and consist of four stories and a basement. The old hospital building, which will adjoin the rear of the new building, is to be remodeled and used as a nurses home. The first floor of the new building will house the clinic. The second and third floors will be devoted entirely to patients, private rooms and ward. The fourth floor will contain an obstetrical department, nursery and the major operating department consisting of two operating rooms. Diet kitchens will be provided on the second, third and fourth floors and will be equipped with electric refrigerators. The new building will provide facilities for the care of 133 patients. The present hospital is equipped to care for only 68. Work on the new project will be started immediately and it is planned to have it ready for occupancy within eight months.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—The Interstate Commerce Commission has authorized this company to construct a 2.6-mile line in Sioux City, Ia., the purpose being to provide a short route with less curvature and lower grades than the company's present line through the city. The old line will not be abandoned, but will be continued as an industrial track. The cost is estimated at $561,070.

COLORADO & SOUTHERN.—The Interstate Commerce Commission has authorized the Colorado Railroad, a subsidiary of the C. & S., to construct an extension to its Ingleside branch from M. P. 12.94 northward 4.7 miles; estimated cost, $110,000. An application of the C. & S. to acquire control of the extension by lease was dismissed without prejudice in view of the fact that the C. & S. has been operating the properties of the Colorado under terms of a lease which expired in 1913.

DELAWARE & HUDSON.—This company is preparing plans and specifications for the elimination of a highway grade crossing on its lines about three miles south of Crown Point, N. Y., at an estimated cost of $123,000.

ERIE.—This company has awarded a contract to Senior & Palmer, New York, for work in connection with the reconstruction of its shops at Susquehanna, Pa., the cost of which, together with equipment, was estimated at $378,000 in the company's 1929 budget plan.

GULF, COLORADO & SANTA FE.—This company plans, following recent authorization by the Interstate Commerce Commission, to resume work on the construction of an extension between Hale, near Dallas, Tex., and the West Dallas industrial district, 7.1 miles. A large part of the grading and bridging had been completed prior to intervention by the Texas & Pacific. The commission order became effective on June 24, requiring completion of the construction before December 31, 1930.

HOCKING VALLEY.—A contract for the installation of two electric car dumpers at the new Presque Isle terminal at Toledo, Ohio, has been let to the Industrial Brown Hoist Corporation, Cleveland, Ohio. A contract for the construction of three Hulett stiff-leg ore unloaders at the same point has been awarded to the Wellman-Seaver-Morgan Company, Cleveland.

ILLINOIS CENTRAL.—Company forces will be employed in the rearrangement of tracks serving mechanical facilities, the enlargement of yards and the rearrangement of the mechanical storehouse and mechanical office force facilities at Monroe, La., at a cost of about $250,000. It is planned to construct by contract a new passenger station having dimensions of 30 ft. by 150 ft., and an umbrella shed 700 ft. long, at a cost of about $100,000.

KANSAS CITY SOUTHERN.—The War Department has approved the construction of a bridge over the Missouri river at a point 1.5 miles east of Randolph, Mo.

LOUISVILLE & NASHVILLE.—A contract for the construction of a 10-story office building at Louisville, Ky., which will serve as an addition to the present office headquarters in that city, has been let to the United Engineers & Constructors, Inc., New York. It is planned to expend about $750,000 for this project.

MISSOURI PACIFIC.—The Interstate Commerce Commission has outhorized the San Antonio, Uvalde & Gulf to construct a branch from Brundage, Tex., southwesterly 4.7 miles; estimated cost, $61,669.

NEW YORK CENTRAL.—This company is preparing plans and specifications for the elimination of a highway grade crossing at Schuyler street on its lines in Utica, N. Y. The elimination will be carried out by the closing of the crossing and the erection of an overcrossing at Barnes avenue, about 735 ft. west of the Schuyler street crossing. The overhead structure is to carry a concrete pavement 30 ft. in width and a concrete sidewalk five feet in width on the westerly side. The project has been estimated to cost about $300,000.

NEW YORK CENTRAL.—This company plans the elimination of the present highway grade crossing on its lines at Main street, Cold Spring, N. Y., by the construction of an overhead bridge at a point about 536 ft. south of the present crossing. The eastern approach to the overcrossing is to terminate in Main street about 145 ft. east of the present crossing. A pedestrian subway will be built approximately on the line of the south sidewalk of Main street.

NEW YORK CENTRAL.—The Interstate Commerce Commission has authorized this company to construct a cut-off on its Putnam division in Westchester county, New York, extending from a point about a mile south of Briarcliff Manor to about one-quarter mile south of East View, 4.6 miles, and upon the completion of this line to abandon the existing line, 6 miles, between these points. The new construction will save 1.4 miles and will reduce a 2.7 per cent grade northbound to 0.85 per cent and 1.8 per cent grade southbound to 0.75 per cent. The new construction will also permit the elimination of a number of grade crossings. The property involved in the line change is owned by John D. Rockefeller, Jr., James Stillman and the Briarcliff Realty Company, who will donate the necessary right-of-way, and Mr. Rockefeller will contribute two-thirds of the cost of construction of the new line; the estimated cost of the construction of which is $1,192,000.

NEW YORK, WESTCHESTER & BOSTON.—This company has awarded a contract to United Engineers & Constructors Inc., Philadelphia, Pa., for the extension of its main line from Rye to Port Chester, N. Y., about two miles, at a cost of approximately $1,000,000. The line is expected to be completed November 15.

SPOKANE, PORTLAND & SEATTLE (OREGON ELECTRIC).—Plans have been announced for the construction of about 69 miles of new line in Linn county, Ore., to serve a timber area which is estimated to contain 30,000,000,000 board feet. The cost of the project will be about $3,000,000, including the construction of 41 miles of main line and 28 miles of branch line. It involves the use of the Southern Pacific between Albany, Ore., and Lebanon, 12 miles.

ST. LOUIS-SAN FRANCISCO.—A contract has been awarded to the Hedges-Weeks Construction Company, Springfield, Mo., for the reconstruction of piers and abutments for bridges between Springfield and Memphis, Tenn., at a cost of about $50,600.

ST. LOUIS SOUTHWESTERN TRANSPORTATION COMPANY.—A contract for the construction of three motor coach shop buildings at Texarkana, Ark., has been let to Bailey, Burns & Fitzpatrick, Dallas, Tex., at a cost of approximately $150,000.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—A contract for the construction of a one-story brick and concrete storage building on South 18th street, St. Louis, Mo., has been let to Dwight P. Robinson & Co., New York. The building, which it is estimated will cost $45,000, will have dimensions of 45 by 173 ft.

TORONTO, HAMILTON & BUFFALO.—A contract has been awarded to the Roberts and Schaefer Company, Chicago, for the construction of a 300-ton capacity three-track coaling station and sanding plant and a three-track electric cinder handling plant at Hamilton, Ont.

WESTERN PACIFIC.—The Interstate Commerce Commission has denied the application of this company for authority to construct a branch line from Brack, Cal., eastward 3.5 miles.

Baltimore Approves Ordinances For Pennsylvania's $22,000,000 Improvement Plans

After more than a year of consideration and controversy the city council of Baltimore, Md., has approved a series of three ordinances presented by the Pennsylvania permitting improvements to its lines running through that city estimated to involve an expenditure by the company of about $22,000,000.

With the council's approval, the Pennsylvania is in a position to proceed with its plans which include the addition of third and fourth tracks to its main line through the city, necessitating the construction of two additional tunnels to run parallel with its two existing tunnels, improvements and enlargements to its Calvert street freight yard facilities, electrification of its main line system through the city and elimination of all grade crossings within the city and additions and improvements to passenger station facilities.

The submitting of the original plan of the Pennsylvania to the Baltimore authorities was announced in the Mar. 3, 1928, issue of the *Railway Age*.

Railway Finance

BALTIMORE & OHIO CHICAGO TERMINAL.—*Trackage Rights.*—The Interstate Commerce Commission has authorized this company to operate under trackage rights over the Chicago Great Western from Forest Park, Ill., to Bellewood, 2.8 miles.

BALTIMORE & OHIO.—*Unification Proceedings.* — The Interstate Commerce Commission has denied a petition of the Business Protective Association, of Baltimore, which had asked that the commission require the elimination of the Western Maryland from this Company's application for authority to acquire control of certain roads in eastern territory or to deny the application in so far as it relates to the Western Maryland. The petition also asked that the B. & O. be required to show cause why it should not be ordered to divest itself of its stock of the Western Maryland prior to any consideration of the application and that the status of the Western Maryland be determined separately from and prior to the consideration of the other matters involved in the application.

BUFFALO, ROCHESTER & PITTSBURGH.—*Lease at Reynoldsville & Falls Creek.*—The Interstate Commerce Commission has authorized this company to acquire control by lease of the Reynoldsville & Falls Creek which extends from Falls Creek, Pa., to Reynoldsville and Soldier Run, approximately 12 miles of line.

CASTLEMAN RIVER.—*Operation.*—The Interstate Commerce Commission has authorized John Hersker, individually and in behalf of the Castleman River, to acquire and operate the line formerly owned by the Castelman Valley extending from a point 5 miles south of Jennings, Md., northerly to the Pennsylvania state line, 12.8 miles, and to operate the properties of the Pennsylvania-Castleman Valley from the state line northerly to a connection with the Baltimore & Ohio at Worth Junction, Pa., 1.2 miles.

CHICAGO & ALTON. —*Foreclosure.*—A report by Master in Chancery Herbert A. Lundahl, recommending the foreclosure of two mortgages on the Chicago & Alton totaling $38,000,000, was taken under advisement by Federal Judge George A. Carpenter at Chicago on June 25. Interest on a mortgage for $22,000,000, dated April 1, 1900, has been in default of interest since January 1, 1923, while another for $16,834,000, dated July 1, 1912, has been in default since January 1, 1917. Attorneys for the holders of the $22,000,000 mortgage, which is under the trusteeship of the Farmers Loan & Trust Company of New York, claim seniority for this mortgage by reason of its prior date. The United States Mortgage & Trust Company of New York, trustees for the $16,000,000 mortgage holders, claim seniority since this mortgage has been in default for a longer period. The report recommends that the holders of the $22,000,000 mortgage have a bona fide claim to the first lien. Whatever decision is made will doubtless be taken to the United States Circuit Court of Appeals with request for a rehearing. Any sale would thus be deferred until late Fall.

CANADIAN NATIONAL.—*Bonds.*—A banking syndicate headed by Dillon, Read & Co., has placed on the market $40,000,000 of this company's 5 per cent guaranteed (by the Dominion government) bonds at 99.75.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Final Valuation.*—The Interstate Commerce Commission has issued a final valuation report as of 1915 finding the final value for rate-making purposes of the property owned and used for common-carrier purposes to be $27,370,000 and that of the property used but not owned to be $4,323,581.

CHICAGO, ROCK ISLAND & PACIFIC.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to guarantee 9,450,000 of 4½ per cent equipment trust certificates, to be used in the acquisition of new equipment to the amount of $12,618,104. It is proposed to solicit bids from bankers and dealers in railway equipment trust obligations.

DETROIT, TOLEDO & IRONTON.—*Sale of Control.*—Henry Ford and his family have disposed of their controlling interest in stock of this company to the firm of Charles D. Barney & Co., acting on behalf of an unnamed principal.

GEORGIA & FLORIDA.—*Lease.*—This company applied to the Interstate Commerce Commission for authority to renew its lease of the Statesboro Northern for five years from June 2.

PENNSYLVANIA.—*Clayton Law Proceedings.* — The Interstate Commerce Commission has postponed from June 24 to an indefinite date the hearing on its complaint alleging violation of the Clayton law in the acquisition of stock of the Lehigh Valley and Wabash. In asking for a postponement the company has informed the commission that the status quo will be maintained pending the determination of rights in the premises; that is, the stock will continue to be held by the Pennsylvania Company.

MINNEAPOLIS & ST. LOUIS.—*Receiver's Certificates.*—The Interstate Commerce Commission has authorized the receiver of this company to issue $300,000 of receiver's certificates, bearing interest not to exceed 8 per cent, to meet maturities or renew an equal amount of such certificates.

NEW YORK, ONTARIO & WESTERN.—*Final Valuation.*—The Interstate Commerce Commission has issued a final valuation report as of 1916 finding the final

value for rate-making purposes of the property owned and used for common-carrier purposes to be $32,800,000 and that of the property used but not owned to be $10,459,907. The recorded book investment in road and equipment was $85,101,627. If certain readjustments were made, the report says, this would be reduced to $71,588,062, of which not less than $54,005,704 is represented by securities issued or assumed.

NORFOLK & WESTERN. —*Acquisition of Terminal Properties at Sewalls Point.*—The Interstate Commerce Commission has authorized this company to acquire and operate terminal properties owned by the city of Norfolk, Va., at Sewalls Point. The property consists of 300 acres of land, a grain elevator, several piers and trackage. The terminal is reached through the line of the Norfolk & Portsmouth Belt, of which the Norfolk & Western is a part owner. The terminal facilities cost the city $5,461,000, represented by outstanding bonds less an accumulation in sinking fund of $625,032. Under the terms of the lease the railway is to lease the properties until 1952, making a semi-annual payment to the city equivalent to interest and sinking fund requirements. At the expiration of the lease the city will convey the property in fee to the railway upon the payment of $625,032, the amount now in its sinking fund.

OREGON & NORTHWESTERN.—*Operation.*—The Interstate Commerce Commission has authorized the Edward Hines Western Pine Company to operate a 50-mile railroad between Burns, Ore., and Seneca, the line formerly having been operated by the Malheur Railroad.

SEABOARD AIR LINE.—*Extension of Maturity of G. C. & N. Bonds.*—The Interstate Commerce Commission has authorized the extention of the date of maturity of $5,360,000 of Georgia, Carolina & Northern bonds from July 1, 1929, to July 1, 1934, with an increase in interest from 5 to 6 per cent.

SEABOARD AIR LINE.—*Notes of Prince George & Chesterfield.*—The Interstate Commerce Commission has authorized the Prince George & Chesterfield to issue $450,000 of short term notes to be secured by the issue of an equal amount of first mortgage, 25-year, 6 per cent bonds, series A, the Seaboard to assume obligation and liability as endorser of these notes. The proceeds of the issue will be devoted to the construction of a line of railroad connecting with the Seaboard at Bellwood, Va., and extending to Hopewell, 16 miles. The entire capital stock of the P. G. & C. is owned by the Seaboard, which will lease the line upon its completion.

SHELBY COUNTY.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $125,000 of first mortgage 5 per cent refunding mortgage bonds, to mature in 1949, which will be exchanged for a similar amount of bonds which mature on July 1.

SOUTHERN PACIFIC.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $6,825,000 of equipment trust certificates, series L, bearing interest at 4½ per cent and maturing semi-annually between 1930 and 1944. The certificates are authorized to be sold to the highest of 64 bidders—a syndicate headed by Estabrook & Company—at 95.41, which will make the average cost to the railroad 5.246 per cent.

SOUTHERN PACIFIC.—*Control of Texas State R. R. by T. & N. O.*—This company, a subsidiary of the Southern Pacific, has been authorized by the Interstate Commerce Commission to acquire control by lease of the Texas State Railroad, owned by the State of Texas, which extends from a connection with the I.-G. N. at Palestine to connections with the S. S. W. and T. & N. O., at Rusk, 32.7 miles. The lease is for a period of 20 years, the property at present being operated by the T. & N. O. under a lease which expired in 1926.

WHEELING & LAKE ERIE.—*Cleveland Terminal Plans.*—Oral argument was heard by the Interstate Commerce Commision on June 17 on this company's application for authority to abandon its Ontario street passenger station at Cleveland, Ohio, and to use the facilities of the Cleveland Terminals Company, which is opposed by the Pittsburgh & West Virginia.

WHEELING & LAKE ERIE.—*Taplins Lose Court Motion.*—A motion by the Taplin interests to set aside the injunction preventing them from placing their own set of officers in control of this railroad was denied by Judge George P. Baer in Common Pleas Court at Cleveland, Ohio, on June 25. The injunction was obtained by the Van Sweringen interests after the Taplin directors had elected a new group of officers during a session which took place following the annual meeting of the roads' directors. Judge Bear gave the Taplin group permission to institute quo warranto proceedings to determine whether the Taplin officers were legally elected. Attorneys for the Taplins stated that this action would be taken soon before either the appellate or supreme court.

Dividends Declared

Atchison, Topeka & Santa Fe.—Common, $2.50, quarterly, payable September 3 to holders of record July 26.

Allegheny & Western.—3 per cent, payable July 1 to holders of record June 20a.

Baltimore & Ohio.—Common, 1½ per cent, quarterly; Preferred, 1 per cent, quarterly; both payable September 3 to holders of record 13a.

Illinois Central.—Common, $1.75, quarterly; Preferred, $3.00, semi-annually; both payable September 3 to holders of record August 1.

Kansas City Southern.—Common, 1¼ per cent, quarterly, payable August 1 to holders of record June 29; Preferred, 1 per cent, quarterly, payable July 15 to holders of record June 29.

Norfolk & Western.—Common, $2.00, quarterly, payable September 19 to holders of record August 31; Adjustment Preferred, $1.00, payable August 19 to holders of record July 31.

Northern Central.—$2.00, semi-annually, payable July 15 to holders of record June 29.

Average Prices of Stocks and of Bonds

	June 25	Last week	Last year
Average price of 20 representative railway stocks.	140.96	137.28	117.63
Average price of 20 representative railway bonds..	89.88	90.26	93.91

Officers

Executive

L. C. Probert, vice-president of the Erie, with headquarters at New York, has been appointed vice-president of the Chesapeake & Ohio, the Hocking Valley and the Pere Marquette, with headquarters at Cleveland, O.

Warren E. Fuller, superintendent of the Galesburg division of the Chicago, Burlington & Quincy, with headquarters at Galesburg, Ill., has been promoted to assistant to the executive vice-president, with headquarters at Chicago, succeeding **E. M. Fairfield,** deceased.

Robert C. Falconer, assistant vice-president and chief engineer of the Erie, with headquarters at New York, has been appointed assistant vice-president in charge of engineering, with the same headquarters, reporting to the president. A photograph and biographical sketch of Mr. Falconer's railway career was published in the *Railway Age* of July 21, 1928, page 131.

W. C. Franz, vice-president and general manager of the Algoma Eastern has been elected president and general manager, with headquarters as before at Saulte Ste. Marie, Ont., succeeding **Robert Dodd,** who has resigned. **J. D. Jones** has been elected vice-president, with headquarters at Saulte Ste. Marie.

William M. Wardrop, who has been appointed assistant vice-president and general agent of the Pennsylvania, with headquarters at Detroit, Mich., has been connected with that railroad for 31 years. He was born at Edgeworth, Pa., on January 8, 1879, and entered the service of the Pennsylvania on July 7, 1898,

William M. Wardrop

as a yard clerk at Allegheny, Pa. For a short time in 1902 he served as a paymaster's clerk in the treasury department and was then appointed assistant trainmaster of the Erie & Ashtabula division at New Castle, Pa. In 1905 Mr.

Wardrop was promoted to trainmaster and in 1911 he was further promoted to superintendent of the Western division at Fort Wayne, Ind. Four years later he was transferred to the Erie & Ashtabula division and in 1920 he was promoted to general superintendent of the Michigan division. In July 1922, Mr. Wardrop was transferred to the Southern division at Wilmington, Del., his promotion to assistant vice-president and general agent at Detroit becoming effective on June 16.

Herman L. Traber, who has been promoted to executive general agent of the Missouri Pacific, with headquarters at Kansas City, Mo., has been connected with various railways in the Mississippi valley for nearly 31 years. He was born on April 27, 1880, at Kansas City and entered railroad service at the age of 18 years on the Kansas City, Fort Scott & Memphis. Until 1911, he served in

Herman L. Traber

various capacities with that railway and its successor, the St. Louis-San Francisco, including those of clerk, contracting agent and chief clerk in the commercial office at Kansas City. Mr. Traber then became commercial agent for the Missouri, Oklahoma & Gulf (now the Kansas, Oklahoma & Gulf) and later general freight and passenger agent, with headquarters at Muskogee, Okla. On May 1, 1919, he was appointed vice-president and general manager of the Okmulgee Northern, with headquarters at Okmulgee, Okla., where he remained until March 1, 1920, when he became traffic manager of the K., O. & G. at Muskogee. In September of the latter year he was advanced to vice-president and general manager of the K., O. & G. From October, 1921, to June 1924, he also served as president of the Oklahoma & Arkansas (now abandoned) then becoming receiver of the former company. In October, 1925, Mr. Traber was appointed general freight agent of the Missouri Pacific, with headquarters at Little Rock, Ark., where he remained until November, 1927, when he was transferred to Kansas City. His promotion to executive general agent became effective on June 1.

Financial, Legal and Accounting

Russell M. Wilson, who has been appointed assistant general real estate agent of the New York, New Haven & Hartford, with headquarters at Boston, Mass., was born on July 18, 1893 at Winchester, Mass. He was graduated

Russell M. Wilson

from Brown University in 1915 and entered the service of the New York, New Haven & Hartford in July of the same year. He was engaged in land valuation work for that road, with headquarters at New Haven, Conn., until April, 1925, when he was transferred to Boston as assistant real estate agent, Lines East. In October, 1926, he was promoted to the position of real estate agent and he served in that capacity until May 16, 1929, when his appointment as assistant general real estate agent of the road became effective.

Operating

G. S. Brecount, terminal trainmaster on the Cleveland, Cincinnati, Chicago & St. Louis at Toledo, Ohio has been transferred to Indianapolis, Ind.

William Davis has been appointed superintendent of the Indianapolis Terminal and the Springfield division of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Indianapolis, Ind.

James R. Branley, trainsmaster of the Gladstone division of the Minneapolis, St. Paul & Sault Ste Marie at Gladstone, Mich., has been promoted to superintendent of the Missouri River division, with headquarters at Bismarck, N. D. **Erwin A. Schwahn** has been appointed trainmaster of the Gladstone division, succeeding Mr. Branley.

E. Stroud, trainmaster on the Portland division of the Southern Pacific at Eugene, Ore., has been transferred to Portland, Ore., to succeed **G. C. Morris**, deceased. **D. J. Russell**, assistant trainmaster at Eugene, has been promoted to trainmaster at the same point, succeeding Mr. Stroud. **E. Kirk** has been appointed assistant trainmaster on the Salt Lake division at Susanville, Cal.

Walter S. Franklin who has been promoted to general superintendent of the Northwestern division of the Pennsylvania, with headquarters at Chicago, has been in the service of the Pennsylvania for 12 years. He was born in 1884 and became a clerk in the transportation department of the Pennsylvania at Philadelphia on October 1, 1906. The following year he was transferred to the freight traffic department and in July, 1909, he was advanced to freight solicitor. Later he served as southern freight agent and as division freight agent. During the World War Mr. Franklin attained the rank of colonel. Following the war he returned to the Pennsylvania and was promoted to assistant general freight agent, a position he held until

Walter S. Franklin

August 31, 1919, when he left the Pennsylvania service. He returned to that railroad on March 1, 1928, and on July 1, he was appointed general agent at Detroit, Mich. His promotion to general superintendent of the Northwestern region became effective on June 16.

Oliver P. Reese, who has been appointed general superintendent of the Southwestern division of the Pennsylvania, with headquarters at Indianapolis, Ind., has been in the service of that railroad for 29 years. He was born at Louisville, Ky., on May 29, 1876, and graduated from Purdue University in 1898. In August of that year he began his railway career as an apprentice on the Louisville & Nashville, later entering the service of the Pennsylvania at Allegheny, Pa., as a draftsman. From September, 1900, to January, 1917, Mr. Reese served successively on the Pennsylvania as a special apprentice, a gang foreman, foreman of tests at the locomotive testing plant at the Columbian exposition at St. Louis, Mo., a motive power inspector, a general division foreman, a master mechanic, and an assistant engineer of motive power. He was then promoted to superintendent of motive power of the Central system of the

Pennsylvania Lines West of Pittsburgh, at Toledo, Ohio. On March 1, 1920, he was transferred to the North Ohio division, with headquarters at the same point, and on March 15, 1921, to the Illinois division at Chicago. He was promoted to assistant general superintendent of motive power of the North-

Oliver P. Reese

western region at Chicago on January 16, 1924, and became superintendent of motive power of the Eastern Ohio division on April 1, 1925. Later Mr. Reese was promoted to general superintendent of motive power of the Central region, with headquarters at Pittsburgh, Pa., his appointment as general superintendent of the Southwestern division becoming effective on June 16.

Harvey E. Wilson, who has been appointed superintendent of the Allegheny and Bradford divisions of the Erie, with headquarters at Salamanca, N. Y., was born on January 23, 1883, at Johnstown, Pa. He entered railway service in 1902 as a brakeman on the Pittsburgh and Wheeling division of the Baltimore &

Harvey E. Wilson

Ohio. He later served as brakeman and conductor on the Middle and Pittsburgh divisions of the Buffalo, Rochester & Pittsburgh and as switchman, conductor and trainmaster on the Bessemer & Lake Erie. Mr. Wilson entered the service of the Erie at Buffalo, N. Y., on September 16 1920, as switchman, and in December, 1920, was transferred in the same capacity to Hornell. He also served as night general yardmaster at that point. On January 1, 1923, he was appointed general yardmaster at Elmira, and in August, 1925, was appointed trainmaster of the Delaware and Jefferson divisions, with headquarters at Susquehanna, Pa. On April 1, 1926, Mr. Wilson was transferred in the same capacity to the Susquehanna division, with headquarters at Binghamton, N. Y., and on December 1, 1928, was transferred in the same capacity to Hornell, N. Y., which position he was holding at the time of his recent appointment.

Traffic

J. E. Henry, commercial agent on the Chicago & Alton, has been promoted to coal freight agent, with headquarters as before at Chicago.

Elmer Kessler and **A. M. McCallum** have been appointed assistant foreign freight agents of the Chesapeake & Ohio at Cincinnati, Ohio, and Detroit, Mich., respectively.

W. S. Thomas, division freight agent of the Pennsylvania, with headquarters at Williamsport, Pa., has been appointed assistant general freight agent, with headquarters at Philadelphia, Pa.

F. A. Gehrman, chief clerk to the assistant freight traffic manager of the Missouri Pacific Lines at Houston, Tex., has been promoted to assistant general freight agent, with headquarters at the same point.

A. J. Seitz, general agent of the freight department of the Union Pacific system at Salt Lake City, Utah, has been promoted to assistant to the freight traffic manager, with headquarters at Omaha, Neb. **B. W. Hanson** has been appointed general agent of the freight department at Salt Lake City to succeed Mr. Seitz.

C. H. Mathews, Jr., assistant general traffic manager of the Pennsylvania, with headquarters at Philadelphia, has been appointed to the newly created position of general traffic manager, passenger department. He will have jurisdiction over passenger traffic matters of the entire system. **J. P. Anderson,** passenger traffic manager, with headquarters at Chicago, has been appointed assistant to the general traffic manager, passenger department, with the same headquarters. **William Pedrick, Jr.,** passenger traffic manager at New York, has been appointed assistant to the general traffic manager, passenger department, with headquarters in the same city. **F. W. Conner,** passenger traffic manager at Pittsburgh, has been transferred in the same capacity to Philadelphia. **A H. Shaw,** general passenger agent, with headquarters at Chicago, has been appointed passenger traffic manager, with headquarters at New York. **R. M. Flocker,** assistant general passenger agent, with headquarters at Philadelphia, has been promoted to the position of passenger traffic manager at Pittsburgh. **C. E. McCullough,** general passenger agent, with headquarters at Washington, D. C., has been promoted to passenger traffic manager, with headquarters at Chicago. Under the new organization, these passenger traffic managers will report directly to the general traffic manager, passenger department, at Philadelphia. **W. E. Blachley,** assistant general passenger agent, with headquarters at Pittsburgh, Pa., has been promoted to general passenger agent, with headquarters at Philadelphia. **A. B. Smith,** division freight agent, with headquarters at Cleveland, Ohio, has been appointed general passenger agent, with headquarters at Washington, D. C. **W. A. Phillips,** assistant general passenger agent, with headquarters at Philadelphia, has been promoted to general passenger agent, with headquarters at Pittsburgh. **C. G. Pennington,** assistant general passenger agent at New York has been appointed general passenger agent at Chicago. **L. F. Entriken** has been appointed assistant general passenger agent, with headquarters at Pittsburgh, Pa.; **E. M. Holt** has been appointed assistant general passenger agent at Cleveland, Ohio; **R. M. Harvey** has been appointed assistant general passenger agent at St. Louis, Mo., and **F. M. Ware** has been appointed to a similar position at Cincinnati, Ohio. The above appointments are effective July 1.

Engineering, Maintenance of Way and Signaling

M. J. McCoskey has been appointed supervisor of bridges and buildings of the Lehigh Valley, with headquarters at Buffalo, N. Y., succeeding **J. W. Halcomb,** retired.

L. C. Sprague has been appointed consulting engineer of the Chicago, Springfield & St. Louis and the Jacksonville & Havana. He will continue to maintain his connection with the Carrier Holding Corporation.

G. S. Fanning, assistant chief engineer of the Erie, with headquarters at New York, has been promoted to chief engineer, with the same headquarters, reporting to the assistant vice-president on engineering matters and to the vice-president in charge of operation and maintenance on matters within the jurisdiction of that department. The position of assistant chief engineer has been abolished. **J. W. Smith,** office engineer, with headquarters at New York has been promoted to principal assistant engineer, with the same headquarters. **O. V. Derr,** resident engineer at Paterson, N. J., has been promoted to general

office engineer, with headquarters at New York.

Obituary

Charles M. Swift, president of the Philippine Railway, with headquarters at New York, died on June 20 at his home at Grosse Point, Ferrisburg, Vt.

Daniel Coughlin, general manager of the first district of the Chicago, Rock Island & Pacific with headquarters at Des Moines, Iowa, died at his home in that city on June 26, after an illness of several months.

John D. Maxwell, master mechanic of the Mobile shops of the Louisville & Nashville, died of heart trouble at his home at Mobile, Ala., on May 16. Mr. Maxwell had been master mechanic at Mobile for nearly 22 years and had been in the service of the L. & N. for 48 years.

Minor C. Keith, president of the International Railways of Central America the Atlanta & St. Andrews Bay and the Guatemala Central and founder of the United Fruit Company, died on June 14 of pneumonia at his home in West Islip, L. I. Mr. Keith was born in Brooklyn, N. Y., on January 19, 1849. He was educated in private schools and in 1870 entered the lumber business as lumber surveyor. When he was 21 he sold out his lumber interests and bought a cattle ranch at the mouth of the Rio Grande, remaining there for two years. In 1872 Mr. Keith joined

Minor C. Keith

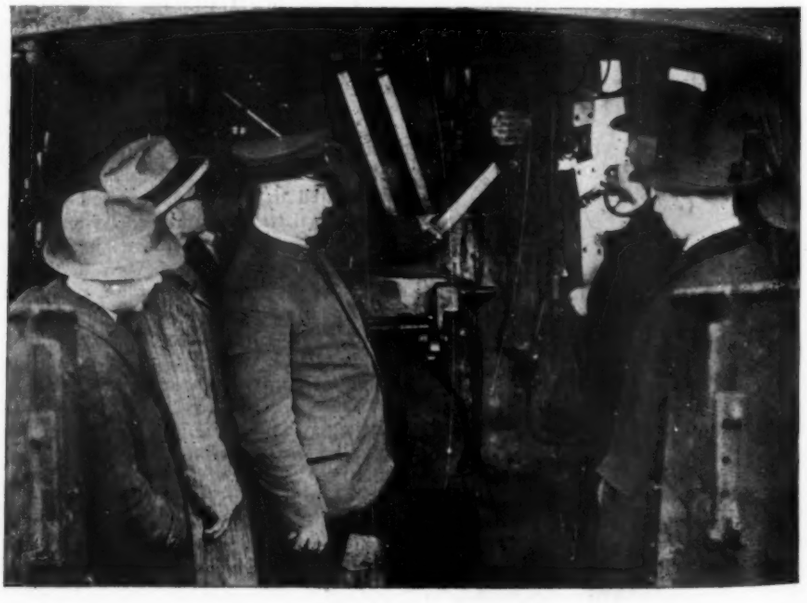
his brother, Henry Meiggs Keith, in the construction of a railroad in Costa Rica, extending from Puerto Limon to San Jose. Upon the death of his brother, Mr. Keith continued the construction of the line, personally arranging for the financing of the enterprise. In the meantime Mr. Keith had started a banana plantation in Central America, gradually developing the raising and shipping of this product until 1899, when he and Andrew W. Preston organized the United Fruit Company. Mr. Keith was also the organizer of the Guatemalan Railways, which in 1912 became the International Railways of Central America, his most recent connection having been the negotiation of a loan in England for the financing of this railroad for the Republic of Salvador.

Charles Mack Levey, former president of the Western Pacific and for the past two years assistant to the chairman of the board of that railroad, died in New York on June 24, following a short illness. Mr. Levey was nearly

Charles Mack Levey

71 years of age, and at the time of his death was completing a trip around the world. He had been in railway service for 58 years, 11 of which were spent as president of the Western Pacific. Born on July 27, 1858, near Olena, Ohio, Mr. Levey obtained his first railway experience as a telegraph operator on the Michigan Central from April, 1871, to June, 1872. Later he served as a night telegraph operator on the Burlington & Missouri River (now part of the Chicago, Burlington & Quincy) at Red Oak, Iowa, and on the Burlington as operator, clerk to the general agent and trainmaster at Creston, Iowa, as chief clerk to the superintendent of the Iowa lines at Burlington, Iowa, and as chief clerk to the general superintendent and the assistant general manager at the same point. From January, 1883, to June, 1892, he was successively superintendent and general superintendent of the St. Louis, Keokuk & Northwestern and the Chicago, Burlington & Kansas City (now parts of the Burlington), at Keokuk, Iowa, then being appointed general superintendent of the Iowa lines of the Burlington. In May, 1902, Mr. Levey was promoted to general manager of the Missouri lines, with headquarters at St. Louis, Mo., where he remained until February, 1904, when he was appointed assistant to the president of the Northern Pacific, with headquarters at Tacoma, Wash. In June, 1905, he was elected third vice-president, with headquarters at the same point, and on November 1, 1909, he was elected second vice-president and general manager of the Western Pacific, with headquarters at San Francisco, Cal. From March 1915 to July, 1916, he acted as general manager for the receivers of the Western Pacific and when the road was reorganized on the latter date he was elected president. He had also been president of the Tidewater Southern and the Deep Creek, Western Pacific subsidiaries. Mr. Levey retired from the presidency on April 1, 1927, and until the time of his death occupied the position of assistant to the chairman of the board of directors.

* * * *



Acme

Future Enginemen of Germany Studying a Locomotive

A special school where students of railroading study the theory and also have apparatus at hand for practical application has been established in Brandenberg, Germany. The picture above shows a class at work.